Flattening the World: Building the 21st Century Global Knowledge Society

We live in a time when collaborations between countries and continents have never been easier, at least from a technical standpoint. A stunning example is the Large Hadron Collider, which is being used by a multinational group of physicists to understand the fundamental building blocks and laws of nature, from subatomic to cosmic. Stores of information and knowledge can be accessed from anywhere by anyone. Remote sensing technology enables the detailed observation of virtually every aspect of our planet’s surface, subsurface, and climate. Technology and the Internet are transforming education. Learning is, in principle, available to everyone everywhere.

The 21st century is shaping up to be a challenging one. The issues that face us are many: climate change, energy, agriculture, health, water, biodiversity and ecosystems, population growth, and economic development. The 2012 program will focus on the complex challenges of the 21st century that are both global in their scope and profoundly interconnected as well as ways to tackle them on a global scale through international, multidisciplinary efforts.

Symposium proposals for the 2012 meeting are now being solicited. To submit a proposal, visit www.aaas.org/meetings. The deadline for submission is Tuesday, 26 April 2011.

Call for Poster Submissions

Student Poster Competition
Open to college undergraduate and graduate students only
The competition recognizes the individual efforts of students who are actively working toward a college-level degree. Winners in each category receive a cash award and framed certificate, and are listed in Science.

General Poster Session
Open to postdocs and professionals
This session provides an opportunity for postdocs and professionals to present their research to the broad community of scientists attending the AAAS Annual Meeting.

Information about the call for poster submissions for the 2012 Annual Meeting will be available at aaas.org/meetings on 12 May 2011.
NSF Robert Noyce Teacher Scholarship Program Conference

Building Excellence in STEM Teaching

July 6-8, 2011
Renaissance Washington DC Hotel

Co-hosted by
American Association for the Advancement of Science (AAAS)
Education and Human Resources Program (EHR)
and
National Science Foundation (NSF) Division of Undergraduate Education (DUE)
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National Science Foundation (NSF) Robert Noyce Teacher Scholarship Program

The Robert Noyce Teacher Scholarship Program, first authorized under the National Science Foundation Authorization Act of 2002 (P.L. 107-368) and reauthorized in 2007 under the America COMPETES Act (P.L. 110-69) and the America COMPETES Reauthorization Act of 2010 responds to the critical need for K-12 teachers of science, technology, engineering, and mathematics (STEM) by encouraging talented STEM students and professionals to pursue teaching careers in elementary and secondary schools.

The program provides funding to institutions of higher education to provide scholarships, stipends, and programmatic support to recruit and prepare STEM majors and professionals to become K-12 teachers. Scholarship and stipend recipients are required to complete two years of teaching in a high-need school district for each year of support. The program seeks to increase the number of K-12 teachers with strong STEM content knowledge who teach in high-need school districts.

In addition, the program supports the recruitment and development of NSF Teaching Fellows who receive salary supplements while fulfilling a 4-year teaching requirement and supports the development of NSF Master Teaching Fellows by providing professional development and salary supplements while they are teaching for five years in a high-need school district. A goal of the program is to recruit individuals with strong STEM backgrounds who might otherwise not have considered a career in K-12 teaching.

The American Association for the Advancement of Science (AAAS) is working with the NSF Robert Noyce Teacher Scholarship Program to identify and disseminate information about effective practices and strategies for attracting, selecting, and preparing new K-12 STEM teachers and retaining them in the STEM teacher workforce. Project components include:

- Producing a general publication that highlights the accomplishments of the NSF Noyce Teacher Scholarship Program.
- Organizing proposal preparation workshops.

American Association for the Advancement of Science (AAAS)

The American Association for the Advancement of Science (AAAS) is the world’s largest general scientific society, and publisher of the journal, Science (www.sciencemag.org) as well as Science Translational Medicine (www.sciencetranslationalmedicine.org) and Science Signaling (www.sciencesignaling.org).

AAAS was founded in 1848, and includes some 262 affiliated societies and academies of science, serving 10 million individuals. Science has the largest paid circulation of any peer-reviewed general science journal in the world, with an estimated total readership of 1 million.

The non-profit AAAS (www.aaas.org) is open to all and fulfills its mission to “advance science and serve society” through initiatives in science policy; international programs; science education; and more. AAAS is a global organization, with offices in Washington, D.C. and Cambridge, U.K., and award-winning news correspondents reporting from an array of countries.

For the latest research news, log onto EurekAlert!, www.eurekalert.org, the premier science-news Web site, a Service of AAAS. For education and career resources visit the AAAS website at http://www.aaas.org/.
WEDNESDAY, JULY 6, 2011

3:45 pm - 5:00 pm  Museum Tours for Scholars and Fellows (optional) (Grand Registration - Grand Ballroom Level)

4:30 pm - 5:30 pm  New Awardees Session with National Science Foundation (NSF) Program Officers (Congressional Hall A&B)

5:30 pm - 7:00 pm  Effective Project Leadership: Advice from Exemplars (Congressional Hall A&B) Elizabeth Cady, Program Officer, Center for the Advancement of Scholarship on Engineering Education, National Academy of Engineering

7:00 pm - 10:00 pm  Registration (Grand Registration) Poster Setup (Renaissance Ballroom)

THURSDAY JULY 7, 2011

7:00 am - 8:00 am  Registration (Grand Registration) Poster Setup (Renaissance Ballroom) Continental Breakfast (Foyer Grand Ballroom North)

8:00 am - 9:00 am  Opening and Welcome (Grand Ballroom North & Central) Katherine J. Denniston, Acting Division Director, Division of Undergraduate Education (DUE), NSF Alan I. Leshner, Chief Executive Officer, AAAS and Executive Publisher, Science

Plenary: “The Third STEM Crisis: Defending The American Dream In The New Millennium”

Introduction: Joan Ferrini-Mundy, Assistant Director, Directorate for Education and Human Resources, NSF

Plenary Speaker: Sylvester “Jim” Gates, John S. Toll Professor of Physics and Director, Center for String and Particle Theory, University of Maryland

9:15 am - 10:30 am  Concurrent Workshops: Session I (Meeting Rooms 2-15)

10:45 am - 11:45 am  Panel: Voices from the Field (Grand Ballroom North & Central) Moderator: V. Celeste Carter, Program Director, DUE, NSF Panelists: Scholars Courtney Greene, Clark Atlanta University, Rome Transitional Academy, Rome, GA Marrielle Myers, North Carolina State University, Southeast Raleigh Magnet High School, Raleigh, NC James Knuuttila, University of Massachusetts, Dartmouth, Fall River Schools, Fall River, MA Michelle Pound, University of Massachusetts, Dartmouth, New Bedford High School, New Bedford, MA

12:00 pm - 1:30 pm  Lunch and Keynote (Grand Ballroom North & Central) Keynote: “What’s a Teacher to Do?” Introduction: Shirley M. Malcom, Director, EHR, AAAS Keynote Speaker: Philip "Uri" Treisman, Professor of Mathematics and of Public Affairs, University of Texas at Austin

Update on Noyce Program Evaluation Ellen Bobronnikov, Abt Associates, Inc.

1:30 pm - 2:45 pm  Poster Session 1 (Renaissance Ballroom)
AGENDA

3:00 pm - 4:15 pm  **Concurrent Workshops - Session II**  
*Meeting Rooms 2-15*

4:30 pm - 5:45 pm  **Poster Session 2**  
*Renaissance Ballroom*

6:00 pm - 7:30 pm  **Reception and Networking**  
*Grand Ballroom South*

**FRIDAY JULY 8, 2011**

7:00 am - 8:00 am  **Continental Breakfast**  
*Foyer Grand Ballroom North*

Remove Poster Boards  
*Renaissance Ballroom*

8:00 am - 9:00 am  **Plenary Session**  
*Grand Ballroom North & Central*

**Introduction:**
Barbara Olds, Acting Deputy Assistant Director, EHR, NSF

**Welcome and Remarks:**
Cora Marrett, Deputy Director, NSF

**Plenary: “Go Out and Do Something Wonderful: The Life and Adventures of Robert Noyce”**

**Introduction:**
Bert Holmes, Program Director, DUE, NSF

**Plenary Speaker:**
Pendred “Penny” Noyce, Trustee, Noyce Foundation

9:10 am - 10:25 am  **Concurrent Workshops - Session III**  
*Meeting Rooms 2-15*

10:35 am - 11: 50 am  **Concurrent Workshops - Session IV**  
*Meeting Rooms 2-15*

12:00 pm - 12:30 pm  **Plenary and Closing Remarks**  
*Grand Ballroom North & Central*

12:30 pm  **Conference Adjourns**

1:00 pm - 2:30 pm  **Museum Tours for Scholars and Fellows (optional)**  
*Grand Registration - Grand Ballroom Level*
Elizabeth Cady

Elizabeth Cady is a Program Officer at the Center for the Advancement of Scholarship on Engineering Education (CASEE) at the National Academy of Engineering. CASEE facilitates research on and deployment of, innovative policies, practices, and tools designed to enhance the effectiveness and efficiency of systems for the formal, informal, and lifelong education of engineers. She received her doctorate in Cognitive and Human Factors Psychology from Kansas State University.

Katherine J. Denniston

Denniston received a B.A. in Biology from Mansfield University and a Ph.D. in Microbiology from The Pennsylvania State University. Following two years as a post-doctoral fellow in the Department of Genetics at the University of Wisconsin Madison, Denniston joined the National Cancer Institute as a Senior Staff Fellow. She then worked as a Research Assistant Professor in the Division of Molecular Virology and Immunology of Georgetown University.

In 1985, Denniston joined the faculty of Towson University, holding a variety of positions over the years. She was Professor of Biological Sciences and for many years held the position of Director of the Center for Science and Mathematics Education. In that position she ran a variety of programs including the Maryland Collaborative for Teacher Preparation II, the Maryland Educators’ Summer Research Program, and the Maryland Governor’s Academy for Science and Mathematics Teachers. Denniston and co-authors Robert Caret and Joseph Topping have published a chemistry text for allied health majors since 1989. *General, Organic, and Biochemistry* is in its seventh edition.

In 1999, Denniston became the Associate Dean of the Fisher College of Science and Mathematics and in 2008 was appointed Associate Provost of the university. She spent the 2002-2004 academic years as a program officer in the Division of Undergraduate Education (DUE) at NSF and returned to DUE as Deputy Director in 2010 and is currently serving as the Acting Director.

Joan Ferrini-Mundy

Joan Ferrini-Mundy is the Assistant Director of the National Science Foundation (NSF) for Education and Human Resources (EHR). In 2009 she served as Acting Executive Officer for the EHR Directorate, and from January 2007 through December 2009 was Director of EHR’s Division of Research on Learning in Formal and Informal Settings (DRL).

While at NSF, Ferrini-Mundy continues to hold appointments at Michigan State University (MSU) as a University Distinguished Professor of Mathematics Education in the Departments of Mathematics and Teacher Education. She served as Associate Dean for Science and Mathematics Education in the College of Natural Science at MSU from 1999-2006. Ferrini-Mundy was a Visiting Scientist in NSF’s Teacher Enhancement Program from 1989-1991, and served as Director of the Mathematical Sciences Education Board and Associate Executive Director of the Center for Science, Mathematics, and Engineering Education at the National Research Council from 1995-1999. She directed the Michigan Department of Education Teacher Preparation Policy Study Group (2006-2007) and chaired the MI Mathematics High School Content Expectations Development Committee. From 1983-1999 Ferrini-Mundy was a member of the Mathematics Department at the University of New Hampshire, and in 1982-1983 she was a mathematics faculty member at Mount Holyoke College, where she co-founded the SummerMath for Teachers Program.

She has served on the Board of Directors of the National Council of Teachers of Mathematics (NCTM), chaired the Writing Group for NCTM’s 2000 Principles and Standards for School Mathematics, and served on the Board of Governors of the Mathematical Association of America. In 2007-2008, representing NSF, she served as an ex officio member of the President’s National Mathematics Advisory Panel, and co-chaired the Instructional Practices Task Group. Ferrini-Mundy holds a Ph.D. in mathematics education from the University of New Hampshire; her research interests include calculus teaching and learning, the development and assessment of teachers’ mathematical knowledge for teaching, and mathematics and science education policy.

Sylvester “Jim” Gates

Sylvester “Jim” Gates is the John S. Toll Professor of Physics at the University of Maryland at College Park, the first African American to hold an endowed chair in physics at a major research university in the United States. Gates has held appointments at MIT, Harvard, the California Institute of Technology and Howard University and has served as a consultant to the National Science Foundation, the U.S. Department of Energy, the U.S. Department of Defense, the Educational Testing Service and Time-Life Books, and is a member of the Maryland State Board of Education. Gates was named in April 2009 by President Obama as a member of the President’s Council of Advisors on Science and Technology (PCAST). Gates has also been engaged in many issues of science and education policy at the international level.
Professor Gates is a Fellow of the American Association for the Advancement of Science (AAAS), and was named by AAAS as the winner of its 2006 Public Understanding of Science and Technology Award. He is also a Fellow of the American Physical Society (APS), and the National Society of Black Physicists (NSBP), where he was a past president. Gates was the first recipient of the APS Bouchet Award. In 1983, he co-authored the book *Superspace: 1001 Lessons in Supersymmetry*, which more than two decades later remains a standard in the field. He has authored or co-authored over 200 research papers published in scientific journals, and contributed numerous articles in others. Gates has also appeared in four scientific documentaries on PBS.

Among his students, Gates is known as an inspiring teacher and role model. He has received many awards for his work as an educator. His awards include the MIT Martin Luther King, Jr. Leadership Award (1997), the College Science Teacher of the Year of the Washington Academy of Sciences (1999), honorary Ph.D. degrees from Georgetown University (2001) and Loyola University-Chicago (2005), the Klopfsteg Award of the American Association of Physics Teachers (2002). Gates delivered the annual Karplus Lecture to the National Science Teacher’s Association (2007), and received the Public Understanding of Science & Technology Award from the American Association for the Advancement of Science (2007).

Gates has a B.S. degree in both mathematics and physics, and a Ph.D. degree in elementary particle physics and quantum field theory, both from the Massachusetts Institute of Technology. His thesis was the first written at MIT on supersymmetry, an area closely related to string theory.

In 2011, Gates was elected to the American Academy of Arts and Sciences.

**Yolanda S. George**

Yolanda Scott George is Deputy Director and Program Director, Education and Human Resources Programs, American Association for the Advancement of Science (AAAS). She has served as Director of Development, Association of Science-Technology Centers (ASTC), Washington, DC; Director, Professional Development Program, University of California, Berkeley, CA, a pre-college academic enrichment, university retention, and pre-graduate school program in SMT for minorities and women; and as a research biologist at Lawrence Livermore Laboratory, Livermore, California involved in cancer research and cell cycle studies using flow cytometer and cell sorters.

George conducts evaluations, project and program reviews, and evaluation workshops for both the National Institutes of Health and National Science Foundation, as well as reviews SMT proposals for private foundation and public agencies, including Carnegie Corporation of New York, the Ford Foundation, and the European Commission. She develops and coordinates conferences and workshops related to SMT undergraduate reform and recruitment and retention of minorities, women, and persons with disabilities in SMT. She works with UNIFEM, UNESCO, L’Oreal USA and Paris and non-governmental organizations on gender, science, and technology initiatives related to college and university recruitment and retention and women leadership in SMT.

Over the last 25 years she has raised over $80 million for a variety of SMT education initiatives for colleges and universities, associations, and community-based groups. She currently serves as principal investigator (PI) or co-PI on several National Science Foundation (NSF) grants, including the Vision and Change in Undergraduate Biology Education; the Alliance for Graduate Education and the Professoriate (AGEP); National Science Education Digital Library (NSDL) Biological Sciences Pathways; Historically Black Colleges and Universities-Undergraduate Programs (HBCU-UP); Robert Noyce Teacher Scholarship Program; and Transforming Undergraduate Education in STEM (TUES). In addition, George is the lead AAAS staff person for the L’Oréal USA Fellowships for Women in Science Program (postdoctoral fellowships) and the David and Lucile Packard Foundation HBCU Graduate Scholars Program (graduate school fellowships).

George serves on a number of boards or committees, including: International Network of Women Scientists and Engineers (INWES); Maria Mitchell Women in Science Awards Committee; McNeil/Lehrer Productions Online Science Reports Advisory Committee; the Center for the Advancement of informal Science Education Advisory Board; and the South Dakota Biomedical Research Network Advisory Committee; Burroughs Wellcome Fund, Science Enrichment Program Grants, Advisory Board; and The HistoryMakers, ScienceMakers, Advisory Board.

George has authored or co-authored over 50 papers, pamphlets, and hands-on science manuals. She received her B.S. and M.S. from Xavier University of Louisiana and Atlanta University in Georgia, respectively.

**Alan I. Leshner**

Alan I. Leshner has been Chief Executive Officer of the American Association for the Advancement of Science and Executive Publisher of the journal *Science* since December 2001.
AAAS (triple A-S) was founded in 1848 and is the world's largest, multi-disciplinary scientific and engineering society.

Before coming to AAAS, Leshner was Director of the National Institute on Drug Abuse (NIDA) from 1994-2001. One of the scientific institutes of the U.S. National Institutes of Health, NIDA supports over 85% of the world’s research on the health aspects of drug abuse and addiction.

Before becoming Director of NIDA, Leshner had been the Deputy Director and Acting Director of the National Institute of Mental Health. He went to NIMH from the National Science Foundation (NSF), where he held a variety of senior positions, focusing on basic research in the biological, behavioral and social sciences, science policy and science education.

Leshner went to NSF after 10 years at Bucknell University, where he was Professor of Psychology. He has also held long-term appointments at the Postgraduate Medical School in Budapest, Hungary; at the Wisconsin Regional Primate Research Center; and as a Fulbright Scholar at the Weizmann Institute of Science in Israel. Leshner is the author of a major textbook on the relationship between hormones and behavior, and has published over 150 papers for both the scientific and lay communities on the biology of behavior, science and technology policy, science education, and public engagement with science.

Leshner received an undergraduate degree in psychology from Franklin and Marshall College, and M.S. and Ph.D. degrees in physiological psychology from Rutgers University. He also has been awarded six honorary Doctor of Science degrees. Leshner is an elected fellow of AAAS, the National Academy of Public Administration, the American Academy of Arts and Sciences, and many other professional societies. He is a member of the Institute of Medicine of the National Academies of Science and Vice-Chair of its governing Council. The U.S. President appointed Leshner to the National Science Board in 2004. He is also a member of the Advisory Committee to the Director of NIH.

Shirley M. Malcom

Shirley M. Malcom, Director for Education and Human Resources (EHR) Programs at AAAS, has served as a program officer in the NSF Science Education Directorate; an assistant professor of biology, University of North Carolina, Wilmington; and a high school science teacher. Malcom received her PhD in Ecology from the Pennsylvania State University; Master’s in Zoology from the University of California, Los Angeles; and Bachelor’s with distinction in Zoology from the University of Washington. In addition, she holds 16 honorary degrees.

Malcom serves on several boards, including the Heinz Endowments and University Corporation for Atmospheric Research. She serves as a trustee of Caltech and as a Regent of Morgan State University. In 2003, Malcom received the Public Welfare Medal of the National Academy of Science, the highest award granted by the Academy. She was a member of the National Science Board, the policymaking body of NSF, from 1994 to 1998, and of the President’s Committee of Advisers on Science and Technology from 1994 to 2001.

Cora B. Marrett

Cora Marrett was confirmed by the U.S. Senate on May 26, 2011, to serve as Deputy Director of the National Science Foundation (NSF). She is the 12th deputy of the foundation.

Marrett has served as the senior advisor for Foundation affairs since February 2011. She served as NSF acting director when Arden L. Bement resigned in June 2010, and before Subra Suresh was confirmed as NSF director in October 2010.

Previously, Marrett served as the assistant director for NSF’s Education and Human Resources (EHR) directorate from 2007-2009. While there, she led the directorate to support NSF’s mission to achieve excellence in U.S. science, technology, engineering and mathematics (STEM) education at all levels and in both formal and informal settings.

From 1992-1996, Marrett served as NSF’s assistant director for social, behavioral and economic sciences (SBE). For her leadership in developing new research programs and articulating the scientific projects of this new directorate, Marrett received NSF’s Distinguished Service Award.

Prior to returning to NSF in 2007, Marrett served as the University of Wisconsin’s senior vice president for academic affairs for six years. Before that, she served as senior vice chancellor for academic affairs and provost at the University of Massachusetts-Amherst for four years.

Marrett holds a bachelor of arts degree from Virginia Union University, and master of arts and doctorate from the University of Wisconsin-Madison, all in sociology. She received an honorary doctorate from Wake Forest University in 1996, and was elected a fellow of the American Academy of Arts and Sciences in 1998 and the American Association for the Advancement of Science in 1996. She received an honorary doctorate from Virginia Union, her alma mater, in May 2011.
Pendred “Penny” Noyce

Pendred “Penny” Noyce is a doctor, advocate for education reform, and children’s author. As founding trustee of the Noyce Foundation, which supports improvements in US mathematics and science education, she has been active in promoting professional development and standards-based reform. From 1993-2002, she served as co-PI of the Massachusetts State systemic Initiative, PALMS, during a period when the state began to lead the nation in math and science achievement. Her current efforts within the Noyce Foundation center around promoting improvements in informal and out-of-school science programming. Penny is also active on many non-profit boards, including those of the Rennie Center for Education Policy Research, TERC, the Concord Consortium, the Maine-based Libra Foundation, and the Gulf of Maine Research Institute.


Barbara M. Olds

Barbara M. Olds is Acting Deputy Assistant Director and Senior Advisor to the Directorate for Education and Human Resources (EHR) of the National Science Foundation. She previously served in EHR as an Expert/Consultant on education issues, as Division Director for the Division on Research, Evaluation and Communication, and as Acting Division Director for the Division of Elementary, Secondary, and Informal Education. She served two terms on the International Advisory Committee for NSF and chaired the Committee of Visitors for NSF’s international activities in 2008.

Olds is Professor Emerita of Liberal Arts and International Studies at the Colorado School of Mines. During her long career there, she served in many capacities, most recently as the Associate Provost for Educational Innovation. Her research interests lie primarily in understanding and assessing engineering student learning. She has been active in the engineering education research and evaluation communities, publishing numerous papers, making presentations, and conducting invited workshops globally. She is a Fellow of the American Society for Engineering Education, a Senior Editor for the Journal of Engineering Education, and was a Fulbright lecturer/researcher in Sweden. She holds an undergraduate degree from Stanford University and an M. A. and Ph.D. from the University of Denver, all in English.

Philip "Uri" Treisman

Philip "Uri" Treisman is professor of mathematics and of public affairs at the University of Texas at Austin, where he is the founder and director of the Charles A. Dana Center. He is a senior partner at the Carnegie Foundation for the Advancement of Teaching, where he is working on new approaches to helping students succeed in community college mathematics courses. He is a senior advisor to the Aspen Institute’s Urban Superintendents’ Network and serves on the boards of the New Teacher Project, the AFT Innovation Fund, and the Military Child Education Coalition (MCEC). He recently served on the STEM working group of the President’s Council of Advisors on Science and Technology and on the Carnegie Institute for Advanced Study Commission on Mathematics and Science Education. He was a founding member of the board of the National Center for Public Policy in Higher Education. Uri was named a MacArthur Fellow in 1992 for his work on nurturing minority student high achievement in college mathematics and 2006 Scientist of the Year by the Harvard Foundation of Harvard University for his outstanding contributions to mathematics.
SESSION I: Thursday, July 7, 2011  
9:15am - 10:30am

1.1 How to CSCSify Inquiry Science Lessons for K-16 Science Classrooms Using Google Tools  

Length of Session: 75 minutes

Virginia Oberholzer Vandergon, California State University, Northridge, virginia.vandergon@csun.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff

Topic: Resources for Teachers

Computer Supported Collaborative Science (CSCS) is a program that a team of university faculty is using to model ways of teaching science, using both hands-on experiments and technology to enhance student science learning. Our team uses this model in their own university classrooms, in Professional Development with middle school and high school teachers, and in working with our Noyce Scholars. This presentation will provide examples of how this model works and you will work with a few Google tools to show you how you can CSCSify your own lessons.

Science teaching can be engaging when using inquiry lessons, but often students run out of time, lose their lab notebooks, or make mistakes in their data collection. Using collaborative Google tools, you can turn some of your classic labs into more interactive lessons by conducting whole class analysis of data sets, emphasizing content the lesson was intended to teach and provide real examples of the Nature of Science in the classroom setting. As students analyze their own data in the context of a larger data set, they are better positioned to understand the collaborative nature of the scientific endeavor, and the need for independent verification and repeatability of findings. Numeric data can be graphed and charted directly in the web-based spreadsheets as well as shared predictions made. The resulting charts and tables can be linked to the lab report, and shared with the class through a class blog. (If you have a laptop, bring it to the session.)

1.2 Using the Atlas of Science Literacy and the NSDL Science Literacy Maps  

Length of Session: 75 minutes

Ted Willard, AAAS Project 2061, twillard@aaas.org

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows

Topic: Resources for Teachers

Among science educators, there is growing interest in learning progressions, defined by the National Research Council as "descriptions of the successively more sophisticated ways of thinking about a topic that can follow one another as children learn about and investigate a topic." The most comprehensive presentation of learning progressions to date is the collection of conceptual strand maps published in the two-volume Atlas of Science Literacy, with maps on topics such as weather and climate, evolution, chemical reactions, energy transformations, the scientific world view, and detecting flaws in arguments.

Digital versions of the maps are available through the National Science Digital Library (NSDL), a national network of digital environments dedicated to fostering STEM education in a variety of settings. With just a click or two, users of the Science Literacy Maps on nsdl.org can quickly move from one map to another, see summaries of student misconceptions, and find a list of relevant STEM resources in the NSDL digital collection.

In this session, participants will review development of the Atlas and the standards documents that preceded it. They will work in a small group to construct a learning progression based on a set of learning goals so that they can gain a deeper understanding of the issues involved in developing a map and gain insight into how to it. Finally, they will review the Science Literacy Maps and explore how to carry out various tasks using the maps on NSDL, such as selecting resources, reviewing student misconceptions, and sequencing instruction.

1.3 Inquiry Science Instruction: Structures, Norms, and Classroom Culture  

Length of Session: 75 minutes

Emily Quinty, University of Colorado, Boulder, emily.quinty@gmail.com
Laurie S. Langdon, University of Colorado, Boulder, Laurie.Langdon@colorado.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers

Topic: Resources for Teachers

In this session, participants will review development of the Atlas and the standards documents that preceded it. They will work in a small group to construct a learning progression based on a set of learning goals so that they can gain a deeper understanding of the issues involved in developing a map and gain insight into how to it. Finally, they will review the Science Literacy Maps and explore how to carry out various tasks using the maps on NSDL, such as selecting resources, reviewing student misconceptions, and sequencing instruction.
In the Streamline to Mastery professional development program, the four participating teachers engage in meaningful discourse and action research around the topic of inquiry science instruction. In this workshop, Streamline teachers will share the group’s key learning about the essential components of inquiry instruction by facilitating an inquiry lesson and debriefing with workshop participants. Participants will experience, observe, and understand the key components of quality inquiry-based instruction. Participants will also experience and learn about the structures and norms of a classroom culture that fosters inquiry teaching and learning.

1.4 Sustainable Partnerships for Innovative Teacher Preparation

Length of Session: 60 minutes

Brad Hughes, University of California Irvine, bhughes@uci.edu
David Bader, DBader@lbaop.org, Director of Education
Aquarium of the Pacific

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel

Topic: Partnerships

Developing partnerships between institutes of higher education (IHE) and informal science education (ISE) can be of great benefit to innovative K-12 teacher training. Sustainability of such partnerships is necessary to offer true lasting benefits to the K-12 system. Each of these entities has core needs that may be supported by the other. A partnership that exploits mutually beneficial activities, in ways that are scalable, can weather the cycles of funding that inevitably occur. Partnership examples provide core design principles that can be transferable to other similar institutions or may be applied more broadly.

This highly interactive, hands-on presentation will facilitate your development of a Sustainable Partnership Plan, using our Design Model and referencing our innovative teacher preparation program. As you actively draft your plan, we will explore the partnership between UCI and Aquarium of the Pacific, which established an innovative teacher-training model, UCI CalTeach, with special methods of recruitment and pedagogical experiences.

1.5 Fractions: Equivalence and Representation

Length of Session: 75 minutes

Carol Cronk, San Bernardino County Superintendent of Schools, carol_cronk@sbcss.k12.ca.us

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers

Topic: Resources for Teachers

How important are fractions to secondary teaching? How can you help students who arrive in your class without a solid (or even shaky) conceptual understanding of fractions? What is the equivalence of fractions and why is this concept crucial to the ability to work with fractions? And how do fractions connect in a fundamental way to topics such as linear equations, slope, and trigonometric functions? In this session we will discover answers to these and other questions, while investigating the development of the concept of fractions from primary grades through trigonometry.

1.6 Integrating Math and Literature in the Middle School with Lost in Lexicon

Length of Session: 60 minutes

Pendred Noyce, Noyce Foundation, pnoyce@noycefdn.org

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows

Topic: Innovative Programs/Resources for Teachers

To students, the worlds of literature and mathematics often seem to be completely separate, each speaking its own language. In this session, we will discuss how a sixth grade class used the speaker’s fantasy novel Lost in Lexicon: An Adventure in Words and Numbers to bridge this gap. Attendees will try their hands at learning activities that address slope, irrational numbers, transformations in the plane, Latin word roots, metaphor and more.

The session will include an opportunity for discussion and a handout of books that seek to integrate fiction and mathematics at the middle or high school level. For a preview, check the book website at www.lostinlexicon.com.
**1.7 PROMYS for Teachers: The Effects of An Immersion Program on Noyce Scholars’ Understanding of Teaching and Learning**

*Length of Session: 60 minutes*

Suzanne Chapin, Boston University, schapin@bu.edu
Matthew Chedister, Boston University, mchedister@yahoo.com
Matthew Coleman, Framingham Public Schools, Boston University, mcoleman@framingham.k12.ma.us, Noyce Master Teacher
Darilyn Barney, Boston University, darilynbarney@gmail.com, Noyce Scholar
Blythe Colyer, blythers@gmail.com, Noyce Scholar
Eileen Lee, elee@mathforamerica.org

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, Higher Education Institution Administrators, Evaluators/Education Researchers

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

Research has shown that teachers’ beliefs about teaching mathematics are most strongly influenced by the way they were taught (Thompson, 1992) and that before these can be altered they must have experiences with alternative approaches (Brown, 1982; Schifter & Fosnot, 1993). This presentation will share how scholars at Boston University are introduced to learning by exploration at the beginning of their studies through an immersion program called PROMYS for Teachers. This inquiry-based program focuses on number theory.

Participants will have the opportunity to engage with problems from the program and discuss the types of higher order thinking they promote. Former and current Noyce scholars will present how the program reconceptualized their understanding of the learning process by focusing on active learning, cognitive dissonance, and the construction of the meaning. In addition, Noyce scholars will share what they have learned from the immersion experience and how it has/will affect their teaching of mathematics.

**1.8 This session includes two 30-minute presentations.**

1.8A A College Recitation Experience for Pre-service Secondary Math Teachers

*Length of Session: 30 minutes*

Diana White, University of Colorado Denver, diana.white@ucdenver.edu

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

We present an innovative model of a college internship experience for pre-service secondary mathematics teachers. Additionally, we present data-driven outcomes of this pilot program, with a goal of better understanding the outcomes of various components of a teacher education program. These undergraduate students served as recitation instructors for college trigonometry for a semester, while also participating in a "teaching trigonometry" seminar.

While our investigation initially centered on the impact on the pre-service teachers, we found significant impacts on the trigonometry students and on the instructor who taught the lecture portion of the course.

We focus our talk on these various impacts, discuss potential revisions to the experience for future cohorts of pre-service teachers, and discuss how this experience could benefit other universities.

1.8B A Capstone Course for Future Mathematics Teachers

*Length of Session: 30 minutes*

John Quintanilla, University of North Texas (UNT), John.Quintanilla@unt.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

The 2001 report ,"The Mathematical Education of Teachers," published by the Conference Board of the Mathematics Sciences, recommends that departments of mathematics develop a "capstone course sequence" for teachers in which conceptual difficulties, fundamental ideas, and techniques of high school mathematics are examined from an advanced standpoint. Unfortunately, there does not appear to be a consensus within the profession about how this capstone experience should be implemented. In this workshop, we will discuss the guiding principles, core components and objectives of the capstone course developed at UNT over the past few years. We will
also discuss student perceptions about course content, including how the capstone experience connects the content of upper-level mathematics courses back to the secondary mathematics curriculum as well as distinctive features not encountered in their education coursework. We welcome discussion about features of similar capstone courses offered at other institutions.

1.9 Key Principles of How People Learn

Length of Session: 75 minutes

Victor Donnay, Bryn Mawr College, vdonnay@brynmawr.edu
Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers
Topic: Resources for Teachers

In this hands-on, interactive workshop on pedagogy and learning theory, participants will engage with the three key principles of how people learn: (1) pre-existing knowledge and misconceptions, (2) key ideas, and (3) metacognition and will also learn a variety of Formative Assessment techniques that helps one put these principles into practice.

This workshop will be accessible and relevant to educators from all disciplines and from all levels of the educational continuum including future and practicing K-12 teachers and higher education faculty. Noted educational theorist Father Guido Sarducci will make a guest appearance.

1.10 Fostering Transformative Teacher Leaders: Working Collaboratively to Improve Everyone's Practice

Length of Session: 75 minutes

Judi Fonzi, University of Rochester, Judith.fonzi@rochester.edu
April Luehmann, Warner Graduate School of Education, University of Rochester, April.Luehmann@rochester.edu
Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators
Topic: Teacher Leadership

After almost 20 years of teacher leadership programs, there is very little research about effective practices for preparing teacher leaders. There is a great deal more empirical evidence about what has been tried in specific contexts, given specific roles for teacher leaders (i.e., teacher leaders who will be in-classroom coaches, teacher leaders who will support the implementation of new curriculum, etc.). The fact of the matter is that we cannot possibly anticipate all of the roles teacher leaders will be asked to take on or need to take on in the next 5-10 years. Therefore, we need strategies for developing transformational teacher leaders who are knowledgeable, flexible, and have the skills and dispositions to be agents of change.

Informed by our work, developing such teacher leaders in our recent NSF MSP project, we designed a 5-year teacher leadership development program for our Noyce Master Teaching Fellows. The program begins with a focus on self and one's own teaching, transitions to a focus on mentoring and providing professional development, and ends with a focus on systemic reform and the role of agents of change.

In this workshop, we will introduce the concept of transformative change, share our 5-year plan, and invite the participants to articulate their visions of teacher leadership and work collaboratively on their own plans for fostering such teacher leaders.

1.11 Speed Networking: Who Is here? What Do They Do? Can We Work Together?

Length of Session: 60 minutes

Richard Weibl, AAAS, Rweibl@aaas.org

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators
Topic: Partnership/Networking

The first few hours of any professional meeting are filled with anxiety as we look for people we know and seek out affirmations we are in the right place for what we need to know, learn, and grow. This highly active session will replicate the "Speed Dating" model wherein participants will have a few moments to greet and meet one another, exchange essential information, and hopefully identify at least a couple of potential collaborators or like-minded persons. It is more a networking session and a get acquainted exercise prior to the meeting.
1.12 A Mixed Methods Approach to Research and Evaluation of the Noyce Teacher Scholarship Program in an Urban Environment

*Length of Session: 60 minutes*

Kim Nguyen, Indiana University Purdue University Indianapolis, knguyen@iupui.edu
Greg D. Wegesin, Center for Urban And Multicultural Education (CUME) at IUPUI, gwegesin@iupui.edu

*Target Audience: Project PIs, Co-Pis, Other Faculty/Staff, Evaluators/Education Researchers*

*Topic: Research and Evaluation*

This workshop describes a mixed-method evaluation of the Noyce Scholars Program in an urban campus and community. The evaluation examined the ways in which forty-two Noyce Scholars described their satisfaction with major elements of the program (e.g., pre-service student teaching and in-service mentoring), and measured the extent to which scholars employed knowledge, skills, and abilities articulated in the program’s student learning outcomes.

Descriptions of the quantitative and qualitative tools used to collect data, strategies for analyzing the data, and the mechanism for using data to inform modifications to the support provided to Scholars will be presented. Workshop participants will be invited to share their experiences with research and evaluation methods of their respective programs. This component of the workshop will include a discussion on the merits of mixed methods evaluations versus purely quantitative summative evaluation designs.

1.13 This session includes two 30-minute presentations.

1.13A Noyce Scholars Experiential Learning in the New York City Public Schools

*Length of Session: 30 minutes*

Paul Bischoff, SUNY-Oneonta, bischopj@oneonta.edu
Valerie Boos and Alexander Chase, Noyce Scholars, SUNY-Oneonta

*Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-Pis, Other Faculty/Staff, School and District Administrators*

*Topic: Innovative Noyce Program Practices and Teacher Preparation Models*

Under the direction of Paul Bischoff, nine SUNY Oneonta Secondary Science Education majors were granted the opportunity to observe various school districts within the New York City (NYC) public school system during the winter break of 2011, and eight others participated in May 2011. The main purpose of the NYC trips was ‘experiential learning’ that would enable the participants to make a more informed decision about seeking student teaching, and even permanent teaching positions, in the NYC school system.

To assess the effectiveness of the NYC school experience, participants were asked to complete a series of reflective essays before, during, and after returning from the trip. Upon return the participants met weekly to qualitatively analyze the reflective narrative data. Results of the data analyses revealed that the perceptions of urban teaching shifted from ‘uncertain or not considering a career in NYC’ to ‘excitement about the opportunities’ that urban teaching holds. The SUNY College at Oneonta NYC teaching experience appears highly effective in helping Noyce Scholars make informed decisions about seeking teaching positions in NYC.

1.13B Noyce Teachers’ Reflections on Teaching in High-Poverty Urban Schools: Challenges and Strategies

*Length of Session: 30 minutes*

Angela Kelly, Lehman College, City University of NY, angela.kelly@lehman.cuny.edu
Serigne Gningue, serigne.gningue@lehman.cuny.edu

*Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-Pis, Other Faculty/Staff, School and District Administrators*

*Topic: Supporting New Teachers*

This presentation will focus on several challenges of teaching and learning mathematics and science in urban settings. Lehman College’s Noyce Scholars are now in their first year of teaching in Bronx middle schools. Our session will focus on key aspects of the scholar’s experiences, including their struggles with student performance and motivation, strategies they have developed to strengthen their self-efficacy and resiliency, and how novel strategies for assessing learning have improved their teaching.

First, we will describe our pre-service program structure, which includes academic coursework, internships, modeling research-based teaching practices, and professional
development in technology and local science resources. The scholars enrolled in the program during their senior undergraduate year, and are now first-year master’s students in science or mathematics education. We will examine how the program was designed to maximize teaching effectiveness in high need urban middle schools.

Secondly, we will present data from site visits and focus group interviews that present the concerns and challenges that the Noyce Teachers have experienced during their first year in the classroom. These teachers expressed frustrations related to classroom management, the disconnect between their expectations and student performance, and the chaotic nature of administrative directives. They discussed coping mechanisms and offered suggestions for changes in the structure of our pre-service program to better prepare the second cohort. Finally, we will discuss several assessment techniques that the Noyce Teachers have employed to measure learning and improve their instruction. These strategies have helped them refine their pedagogical practice and increase their effectiveness.

1.14 Enhancing STEM Curriculum with MATLAB and Online Resources

Length of Session: 60 minutes

David Torres, Northern New Mexico College, davytorres@nnmc.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators

Topic: Resources for Teachers/Innovative Noyce Program Practices and Teacher Preparation Models

Northern New Mexico College (NNMC) is proposing the use of software by teachers to improve and enhance learning in K-12 classrooms. At NNMC, we offered Friday Academy in 2010-2011 to Carlos Vigil Middle School in Espanola, NM. Friday Academy is an educational program which brings middle school students to NNMC on Friday to participate in math, science and writing activities led by faculty. In the mathematics sessions, we used MATLAB and an online site http://www.sweethome3d.com to teach physical concepts in an interactive setting.

This presentation will demonstrate the use of MATLAB in simulating planetary motion using Newton's second law and the universal law of gravitation. Students can change the initial velocity of the planets and monitor its effect on the ellipticity of their orbits. MATLAB will also be used to demonstrate the motion of waves. Students can interact with the program by varying the depth of the wave, the size of the pool, the size of the initial disturbance and the strength of gravity. The production of sound waves can be done both visually and aurally with MATLAB. Students can double the frequency of the wave and listen to the higher octave produced. Students will also be exposed to sequences and use sequences to generate fractals. Finally students will learn how to construct their own home with the free online resources provided by Sweet Home 3D© while learning how to compute the area of different types of figures.

We believe teachers in the STEM disciplines can improve their teaching effectiveness by incorporating computer resources into their lesson plans. Interactive learning can be engaging for students and deepen the extent of learning. The focus of one of our Noyce seminars is to familiarize our Noyce scholars with these resources and encourage them to incorporate these resources in their own classrooms.

SESSION II: Thursday, July 7, 2011
3:00pm - 4:15pm

2.1 Interactive Lecture Demonstrations - A Research-Based Minds-On Learning Pedagogy

Length of Session: 75 minutes

Mark Greenman, National Science Foundation, mgreenma@nsf.gov

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff

Topic: Resources for Teachers/Professional Development and Science Specific Pedagogy

In this highly interactive presentation, you will have the opportunity to experience first-hand the Interactive Lecture Demonstration (ILD) learning environment to facilitate physics teaching and learning.

Interactive Lecture Demonstrations (ILDs) provide a pedagogical tool that has been shown to improve college and pre-college student’s conceptual understanding of ideas in classical physics. Whether teaching in a large lecture hall or providing a more intimate single classroom student laboratory
experience, the Interactive Lecture Demonstration 8-step methodology will provide you with a tool to both engage and prepare your students.

2.2 Scientific Inquiry and Engineering Design: Creating Meaningful Contexts for STEM Teaching and Learning

Length of Session: 75 minutes

Louis Nadelson, Boise State University, louisnadelson@boisestate.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Evaluators/Education Researchers

Topic: Innovative Programs/STEM Teaching and Learning

In this session we will explore the use of scientific inquiry and engineering design as instructional contexts for engaging students in exploring STEM content. Further, we will discuss the essential elements that bridge theory and practice to bring authentic learning to STEM curriculum. We will attempt to complete 7 inquiry and design activities during the session. The activities will be hands-on and models of lessons that could easily be adapted or adopted to a wide range of curriculum to reach a variety of subjects. The goal of the session is to inspire consideration of how to best implement scientific inquiry and engineering design as methods to enhance the teaching and learning of STEM.

2.3 Exploring the Nature of Science through Immersion in Research Activities

Length of Session: 60 minutes

John Keller, California Polytechnic State University, jmkeller@calpoly.edu
Robin Williams, University of Maryland Baltimore County, robyn4@umbc.edu, STAR Fellow

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers

Topic: Resources for Teachers

Over the past four summers, the Science Teacher and Researcher (STAR) Program has placed 92 Noyce Scholars from 25 campuses in paid summer research internships at Department of Energy and NASA laboratories (DUE 0952013; DUE 1127161). A primary objective of the program is to provide authentic, immersive experiences involving cutting-edge research that will provide pre-service teachers with stronger perspectives on the nature of science and use of mathematics in research. Supporting education seminars held throughout the summer program help participants connect their research experience with science and math education. In this interactive workshop, we will explore the “nature of science” through modeling of sample education seminar activities that can be included in any secondary science course. Discussion will center on how the “teaching of science” can be more strongly connected to the “doing of science” while simultaneously aligning with science and mathematics education standards. Former STAR Participants and Noyce Scholars with previous lab experience will also be invited to reflect on how their own research experiences as pre-service teachers can influence their classroom practice.

2.4 Putting Math in the Middle: The Conceptual Framework for a Focused Program of Professional Development

Length of Session: 75 minutes

Guershon Harel and Barbara Edwards, Math for America San Diego, bedwards@ucsd.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators

Topic: Innovative Programs/Professional Development

The Math for America San Diego Noyce Fellows participate in a focused professional development program. The goal of this program is to put the mathematical integrity of the content and the intellectual need of the student at the center of the instructional and curricular effort. In this session, the PI, Prof. Guershon Harel, will describe how the program attends simultaneously to teachers’ knowledge of mathematics, student learning, and teaching methods. Co-PI Barbara Edwards will present early findings regarding the effectiveness of this approach. (For a more practical, less theoretical experience of this approach, attend the session titled ‘The Math for America San Diego Noyce Program: Holistic Problems and the Common Core Standards.’)
2.5 Common Core Standards of Mathematical Practice: What Are They, and How Can We Implement Them?

Length of Session: 75 minutes

Davida Fischman, California State University, San Bernardino, fischman@csusb.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PI’s, Co-PI’s, Other Faculty/Staff, School and District Administrators, Evaluators/Education Researchers

Topic: Resources for Teachers

In 2010, virtually all states adopted Common Core State Standards (CCSS) for teaching mathematics. These standards encourage a conceptual approach to mathematics and provide a coherent development of K-12 mathematics through the grades. The CCSS document includes Standards for Mathematical Practice, which describe a variety of expertise, proficiencies, and processes that are valuable tools for all students of mathematics. Whether the content being taught is taken from the current state standards or from the Common Core Standards, these mathematical practices will help increase both understanding and capabilities for our students. We will discuss these Standards of Mathematical Practice, and participants will develop strategies to incorporate them into current teaching while getting a head-start on implementing the Common Core State Standards.

2.6 Activities to Promote Motivation, Reasoning, and Sense-Making in the High School Mathematics Classroom

Length of Session: 60 minutes

Lauren Mann, NC State University, lmann@northcarolina.edu
Jenna Rice, NC State University, jmrice5@ncsu.edu, Undergraduate Noyce Scholar
Ayanna Franklin, NC State University, adfrankl@ncsu.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers

Topic: Resources for Teachers

NCSU scholars will discuss the design, implementation, and evaluation of research-based mathematics tasks that can promote motivation and reasoning for all learners. The scholars will discuss habits that promote motivation, reasoning, and sense-making in the classroom, based on the available research. Participants will engage in several tasks and discuss implementation and evaluation issues.

2.7 Developing Master Teachers in Elementary Mathematics: Arizona Master Teachers of Mathematics (AZ-MTM)

Length of Session: 60 minutes

Matthew D. Felton, University of Arizona, mdfelton@math.arizona.edu
Mary Bouley, University of Arizona, marybouley@cox.net

Target Audience: Noyce Teaching Fellows, Noyce Master Teachers, Project PI’s, Co-PI’s, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel

Topic: Teacher Leadership

In our presentation, we will briefly outline the design of the Arizona Master Teachers of Mathematics (AZ-MTM) program, which began in the spring of 2011. AZ-MTM aims to work with a cohort of approximately 13 elementary Master Teachers of Mathematics (MTMs) over a period of 4 years. During this time the MTMs take courses focusing on content, pedagogy, and research in mathematics education with University of Arizona (UA) faculty as well as courses on professional development and leadership with our partner institutions: the Arizona K12 Center, the Center for Cognitive Coaching, and the Pima County Regional Support Center. The expertise across these institutions is complementary, providing a powerful support network as the MTMs transition into the role of teacher leaders. As the MTMs progress they transition from engaging in professional development for themselves to taking on increasing responsibility and leadership for their own development, such as designing and enacting professional development opportunities for other teachers and working in the UA teacher education program.

Following the outline of our program design, we will engage the audience in a mathematics problem solving activity that was used in the MTMs’ course work. This will be followed by a discussion of the value of such activities: including the importance of developing expertise in content and pedagogy, and the opportunity for the MTMs to reflect on their learning process, as part of the transition into the role of teacher leader.
2.8 Developing and Using Assessments Aligned to Science Learning Goals

*Length of Session: 75 minutes*

Cari Herrmann-Abell, AAAS Project 2061, cabell@aaas.org

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, School and District Administrators, Evaluators/Education Researchers

**Topic: Resources for Teachers**

This workshop introduces Project 2061's approach to science assessment and its criteria and procedures for developing effective items that are carefully aligned to science ideas. The workshop provides the participants with tools and strategies that will help them align items to specific science ideas using Project 2061's "necessity" and "sufficiency" criteria and consider factors --from the use of unfamiliar vocabulary to test-wiseness issues --that can affect the accuracy of the item as a measure of what students know. The workshop also introduces Project 2061's online assessment resources. The assessment resources include a bank of high-quality test items that are closely aligned to ideas in national content standards, lists of common misconceptions students may have, and field test results from a national sample of middle and high school students.

The topics are: (1) Why it helps to know how you know, (2) how we build new knowledge from old knowledge, (3) using multiple senses in order to learn better and more efficiently, (4) recognizing when we need to simplify to essentials, and (5) why word problems in the sciences and mathematics are so hard.

Stated in other words (the same topics in the same order), (1) metacognition, (2) chunking and expertise, (3) multiple sensory modalities as applied to neostriatal versus hippocampal memory pathways, (4) excess cognitive load, and (5) the challenge of transfer because memories are physical cell-to-cell connections. Examples and applications will include mathematics and the sciences. The workshop will include interactive demonstrations of approaches. The goals are to gain a better understanding of some of the barriers to learning, provide methods to shrink barriers to learning, and provide ideas to develop long-lasting improvements in student learning skills.

2.9 Teaching Tips: Small things with Large Effect (Extracts from a Noyce Add-on Class)

*Length of Session: 75 minutes*

Paul Heideman, College of William and Mary, pdheid@wm.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows

**Topic: Resources for Teachers**

The William and Mary program includes a one-credit add-on course, "How Students Learn," that integrates the neuroscience of learning and memory, metacognition, and learning tools. The course goal is to help prospective teachers understand findings from the science of learning for application to their own teaching and their own learning. This workshop presents selected content and exercises from the class. The selections are a subset of topics identified by class members as most interesting and useful to them as prospective teachers and as learners.

This session describes a successful approach to the preparation of STEM teachers — the Alternative Careers in Teaching program (Act!). Act! is a partnership between six institutions of higher education in Northeast Wisconsin. The goal of Act! is to increase the number of licensed and highly qualified math and science teachers. Act! recruits non-traditional adults with a Bachelor's degree or higher to transition from careers as practicing mathematicians and scientists to careers as professional educators. More than 80 individuals have enrolled in Act! since it began in 2006; and more than 500 have inquired about this alternative pathway to becoming a teacher of math or science.

Our session includes information on the administration of a multi-institution program, the customization of our curricu-
2.11 SciMath Teaching Fellows Pilot Program

**Length of Session: 60 minutes**

Ralph Martin, Ohio University/SEOCEMS, martin@ohio.edu
Jeff Connor, Ohio University/SEOCEMS, connorj@ohio.edu
Lauren Metcalf, Noyce Scholar and SciMath Teaching Fellow, lauren.metcalf@gmail.com
Al Cote, Ohio University/SEOCEMS, cote@ohio.edu
Pam Beam, Ohio University/SEOCEMS, beamp@ohio.edu

**Target Audience:** Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Evaluators/Education Researchers

**Topic:** Innovative Noyce Program Practices and Teacher Preparation Models

The SciMath Teaching Fellows Program is an experimental curriculum change effort that is limited to a small number of post-baccalaureate students who have a background in mathematics or science through either formal or informal education. The masters’ degree program is friendly to STEM career changers who prefer a focused accelerated teacher licensing program and wish to become teachers of middle- or high school mathematics or science. Experienced, motivated, adventurous candidates are selected.

This presentation will describe lessons learned from a first-year pilot program and modifications for a long-term teacher preparation model. Participant critique and pilot evaluation will be shared. Participants experienced the following:

- Earn as you learn; achieve a masters’ degree and an initial teaching license in one year and receive graduate tuition with a modest living stipend.
- Teach to learn; assist a teacher mentor for one school year in a classroom while becoming immersed in learning and teaching; expand your understanding of mathematics or science.
- Learn to teach; function as a member of a community of learners (professors, teachers and Fellows) who all share teaching ideas and strive to achieve excellence in teaching.
- Plan-act-assess-reflect-evaluate-advice; think deeply about your growth toward becoming a professional teacher and help the faculty to build a better university program.
- Research and achieve; choose your classroom-based teaching or learning problem, use 21st Century skills throughout your experience, and achieve your masters’ degree by completing your capstone project requirement, while completing your university course assignments.

2.12 A Virtual Professional Learning Community

**Length of Session: 60 minutes**

Marty Sugerik, UNC Wilmington, sugerikm@uncw.edu

**Target Audience:** Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators

**Topic:** Support New Teachers/Induction/Innovative Noyce Program Practices and Teacher Preparation Models

To meet the demands of supporting new teachers (Noyce Teacher Scholars) with limited budgets, geographic limitations, as well multiple schedules, this session provides a model of supplementing face-to-face support with a virtual component. The use of a website designed specifically to house the needs of new teachers is blended with face-to-face opportunities to provide a seamless Professional Learning Community. This workshop will model a system of support that truly differentiates the needs of middle and high School math and science Noyce Teaching Scholars, as they transition into the teaching profession.

Through this website, Teaching Scholars are able to share instructional strategies, methods, and ideas to foster the math and science collaboration. The Teaching Scholars can blog, e-mail, and work collaboratively with colleagues while building a bank of resources. Because the site is through Google, there is a 24/7 / 365 accessibility, which is essential since Teaching Scholars are scattered throughout the southeast counties of North Carolina.

The virtual component, allows the necessary flexibility to meet the challenging demands of supporting new teachers. Additionally, we are able to maintain a Professional Learning Community beyond the traditional face-to-face support. This
type of virtual site can be used in the classroom and is aligned to P21 Partnership for 21st Century Skills. This workshop will model the planning, implementation, and monitoring, as well as the interdisciplinary resources that are housed in the Virtual Professional Learning Community.

2.13 This session includes two 30-minute presentations.

2.13A Selecting Good Noyce Participants

*Length of Session: 30 minutes*

André M. Green, University of South Alabama, green@usouthal.edu
Elexisca Morriessette, University of South Alabama, enm603@jaguar1.usouthal.edu, Noyce ‘Pathway to Science’ Scholar

Target Audience: Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators

Topic: Recruitment and Selection

The Noyce Pathway to Science program at the University of South Alabama requires all candidates interested in becoming Noyce scholars to complete a ten-week (2 days per week) internship. The program pairs the interested candidates with a mentor teacher identified by the partner school district as being a great teacher in a high need school. Students are required to complete a set of activities designed by the mentor teachers during the internship experience. At the end of the experience, candidates interview before a selection committee of high need school principals, the science supervisor of the district, and the principal investigators of the grant. The selection committee then selects the Noyce scholars. These processes will be discussed in this presentation.

2.13B Recruiting STEM Professionals into Noyce: Strategies and Opportunities

*Length of Session: 30 minutes*

Greg Rushton, Kennesaw State University, grush-ton@kennesaw.edu
Nancy Overley, Kennesaw State University, nover-ley@kennesaw.edu

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers

Topic: Recruitment and Marketing Strategies

The Noyce program has historically emphasized the participation of STEM undergraduates from the host institution’s science and math departments. We have observed, however, that a significant proportion (approx. 30-35%) of interest in our science teacher preparation programs has been coming from those with STEM backgrounds who are seeking to apply their content knowledge and professional experience to a K-12 classroom. Through a recent Noyce Teaching Fellows award, we have developed a recruitment and marketing plan in which we partner with professional societies, local STEM employers, university alumni organizations, and employment agencies to identify and select appropriate candidates for our 13-month Master of Arts in Teaching Science program. In this presentation, we will share our ideas, strategies, marketing materials, and challenges to date with those interested in challenging but exciting endeavor.

2.14 TEACH/Here: Program Design and Performance Assessment in an Urban Residency

*Length of Session: 30 minutes*

Susan Benner, University of Tennessee, sbenner@utk.edu

Target Audience: Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

The Teach/Here Urban Teacher Residency program was developed through a partnership between the University of Tennessee, the Public Education Foundation of Chattanooga, Hamilton County Schools, and Knox County Schools. It is an alternative pathway to prepare and retain math/science teachers for urban schools. The workshop will focus on details of our program design, which includes meeting state teacher licensure standards and adhering to the elements of teaching found in the urban residency model of teacher preparation.

The seven elements of teaching we use as our curricular framework are: 1) equity and high expectations; 2) professionalism and commitment to teaching; 3) establishing safe, inviting, culturally sensitive learning environments; 4) instructional planning and implementation expertise; 5) content knowledge and pedagogical competencies; 6) monitoring student progress and assessing learning outcomes; and 7)
reflection, personal growth, and collaboration. Each of these elements is coupled with standards and performance indicators linked to the program curriculum.

One highlight of the program to be featured in this workshop is the Teacher Performance Assessment (TPA) process that was used as a portion of the overall evaluation of their performance during the residency. Tennessee is one of 21 states participating in the TPA Consortium. Each student completed three tasks as a part of TPA: Planning Instruction and Assessment; Engaging Students and Supporting Learning; and Analysis and Reflection. Their materials, including video clips from consecutive days of teaching, were evaluated by a "blind" scorer. TPA allowed our residents to experience the deep reflection and analysis embedded in this process.

SESSION III: Friday, July 8, 2011
9:10am - 10:25am

3.1 Using Digital Libraries for Teaching Physics

Length of Session: 60 minutes

Taha Mzoughi, Kennesaw State University, tmzoughi@kennesaw.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-Pis, Other Faculty/Staff

Topic: Resources for Teachers

A large number of physics resources have become available over the last few years and have been catalogued in several digital libraries. In this session, we will explore a couple of them: The physics front (thephysicsfront.org), the digital library for pre-college physics and the physics source (physicssource.org), the digital library for introductory physics courses. Highlighted will be resources for first time teaching and a variety of simulations and videos for teaching physics. This session will focus on how to effectively use these resources in the physics classroom and in teacher development. Participants are encouraged to bring their laptop to the session.

3.2 This session includes two 30-minute presentations.

3.2A Science Teacher Preparation as a Site-Based Immersive Experience

Length of Session: 30 minutes

J. Steve Oliver, University of Georgia, soliver@uga.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Project PIs, Co-Pis, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

A site-based model for secondary science teacher preparation is used at UGA to immerse prospective science teachers in teaching as soon as they enter the program. We enact this model at a local school and engage all stakeholders among the school employees (i.e., science teachers, administrators, office staff, security guard, media specialists, counselors, etc.) to provide a powerful introduction to science teaching as a career.

In fall 2010, a rural school with 10 science teachers in grades 9 -12 served as host to our site-based courses. Prospective secondary science teachers enroll for a 9 semester hour block that consists of a science curriculum course, an instructional methods of science course, and a practicum. Virtually all of the activities of this 9-hour block were conducted within the school grounds, with students spending approximately equal time learning about pedagogy and observing/teaching high school students.

Each of the school’s science teachers hosted two prospective teachers in their classroom for the practicum component. Across the semester long experience, the prospective teachers’ role evolved from observer sitting on the side to teacher. One of the most significant advantages of this model for teacher preparation is the recruitment of the school’s science teachers to provide instruction during the pedagogy courses as well as serving as mentors during the practicum. Noyce fellows benefit from this model of teacher preparation and develop deeper understandings of schooling and teaching.

3.2B Suburban Science Education and High Needs Schools

Length of Session: 30 minutes

Keith Sheppard, Stony Brook University, keith.sheppard@stonybrook.edu
Angela Kelly, Lehman College, CUNY, angela.kelly@lehman.cuny.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers,
Approximately 50% of all students in the USA attend schools in districts that would be classified as suburban. Despite widespread belief to the contrary, there are many high needs schools located in suburban regions. This presentation will present data from the New York City metropolitan region that highlights the science enrollment patterns of all the school districts in the region, with particular emphasis on those districts that are considered to be high needs.

### 3.3 Create Inquiry-based Science Lessons the Easy Way: A Hands-on Workshop

**Length of Session: 60 minutes**

N. Bharathan, Indiana University of Pennsylvania, Bharathan@iup.edu
Holly Travis, Indiana University of Pennsylvania, NJQH@IUP.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, School and District Administrators

Topic: Resources for Teachers

Developing good inquiry-based lessons, that can maintain the interest and attention of students, is always a challenge. National science standards require that that inquiry and critical thinking be incorporated in science classes at all levels, yet concerns voiced by teachers tend to focus on details like the preparation time, length of the lesson or how much material should be covered. Unless teachers become comfortable with inquiry methods during their training, they may limit their teaching repertoires to what is familiar and simply teach as they were taught. Unfortunately, this doesn’t lead to science lessons that meet the standards and develop thinking and reasoning skills in their students.

By introducing teachers from all levels to a model that infuses inquiry into the lesson format, concerns about the details disappear as they develop activities that fit the different sections of the model. The 5-E model is a template for lesson planning that addresses both content and inquiry standards, leading to increased student learning and decreased teacher stress. This workshop will allow teachers to work in teams to develop 5-E lessons on a variety of topics. Lessons will then be shared and discussed to assist participants in keeping lessons creative, interesting, and standards-based.

### 3.4 The Math for America San Diego Noyce Program: Holistic Problems and the Common Core Standards

**Length of Session: 75 minutes**

Ovie Soto, Math for America San Diego, osoto@sandi.net, Math for America San Diego Noyce Fellows

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff

Topic: Resources for Teachers/Supporting New Teachers

The Math for America San Diego Noyce Program includes a focused and comprehensive program of professional support. Program leader Ovie Soto and two MfA SD Noyce Fellows will introduce attendees to holistic problems, demonstrate their ability to support the Common Core Standards’ eight mathematical practices, and discuss the implementation of holistic problems. Attendees will receive a handout with a set of holistic problems. (For a more theoretical, less practical experience of this approach, attend the session titled “Putting Math in the Middle: The Conceptual Framework for a Focused Program of Professional Development.”)

### 3.5 Using Performance Assessments to Connect Fractions and Rational Expressions: Noyce Scholars as Mentors to Pre-service Elementary Teachers

**Length of Session: 60 minutes**

Joy W. Darley, Georgia Southern University, jdarley@georgiasouthern.edu, Noyce Scholar

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

At Georgia Southern University, Noyce scholars are not only being mentored, but they are also serving as mentors to pre-service elementary teachers. One topic that proves to be problematic for many students is the conceptual understanding of fractions and rational expressions. Since our Noyce scholars with mathematics degrees will be teaching algebra,
it is important that they are fluent with the arithmetic to algebra connection. In addition, it is crucial that these mathematics majors become stakeholders in mathematics education at the elementary school level.

Performance assessments can provide the structure necessary for assisting pre-service elementary teachers in firmly establishing the arithmetic to algebra connection. This session showcases a performance assessment where students are not only required to connect concrete models with standard fraction algorithms, but are also required to explain these connections. In this performance assessment, fraction bars are used with the number line in order to establish the arithmetic to algebra connection. Noyce scholars assist by helping and evaluating these pre-service teachers. By participating, not only do Noyce scholars support elementary teachers, but they also gain strategies and resources needed to teach fractions in a way that leads to conceptual understanding.

3.6 This session includes two 30-minute presentations.

3.6A A Model for Continued Support for Scholars

Length of Session: 30 minutes

Elsa Medina, Cal Poly State University, emedina@calpoly.edu
Davina White, dwhite177@yahoo.com, Noyce Scholar
Jose Diaz, hplife95@yahoo.com, Noyce Scholar

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Project PIs, Co-Pis, Other Faculty/Staff, Higher Education Institution Administrators
Topic: Innovative Noyce Program Practices and Teacher Preparation Models

The Cal Poly Math Noyce Scholarship program received funding from NSF to offer summer workshops for scholars from our program and from other programs in the western region. The workshop’s evaluations have been very positive and scholars have stated that these workshops are one of the best components of our program. In this talk we will share our workshop’s model and examples of scholars’ activities. Two scholars will also share their experiences in the workshops.

3.6B Studio Math Classroom: A Model for Developing Leadership, Mentoring, and Fostering Professional Learning

Length of Session: 30 minutes

Thomas Dick, Oregon State University, tpdick@math.oregonstate.edu
Melissa Plummer, Roseburg School District, MPlummer@roseburg.k12.or.us, Master Teaching Fellow

Target Audience: Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-Pis, Other Faculty/Staff, School and District Administrators
Topic: Innovative Noyce Program Practices and Teacher Preparation Models

The Studio Math Classroom is a platform for a professional learning community to focus on student mathematical thinking. Resident teachers, preservice interns, and administrators collaborate with a peer — the Studio Teacher — and a consultant to explore math content in the context of a mathematics lesson that involves a live classroom enactment of teaching practices being discussed. Participants in the presentation will leave with 1) an understanding of the model of the Studio Math Classroom and how it works, and 2) knowledge of how the model is used to develop leadership in experienced teachers as well as a platform for mentoring new and preservice teachers.

3.7 This session includes two 30-minute presentations.

3.7A Recruitment and Selection of Phase I Noyce Teacher Scholars at East Central University (ECU), Ada, Oklahoma

Length of Session: 30 minutes

Robert Ferdinand, East Central University, rferdand@ecok.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Project PIs, Co-Pis, Other Faculty/Staff, Evaluators/Education Researchers
Topic: Recruitment and Marketing Strategies

This presentation will describe recruitment and marketing strategies for each cohort of ECU Noyce scholars. It will then describe the competitive selection criteria used to select Noyce scholars from among the applicants. Considerations given to applicants that are female or from under-
represented populations will be stated. Demographics of the current Noyce cohorts will be illustrated and future recruitment strategies will be discussed. Finally, recommendations on more effective recruitment and marketing, to be implemented in the future, will be entertained from the audience.

3.7B  Student Perceptions About Teaching Mathematics in High-Need Schools

Length of Session: 30 minutes

Blidi Stemn, Hofstra University, catbss@hofstra.edu
Behailu Mammo, Hofstra University, matbzm@hofstra.edu

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff
Topic: Recruitment and Marketing Strategies

This presentation reports preliminary findings of a qualitative investigation of undergraduate mathematics students' perceptions of teaching mathematics in a high-need school. The students, who were predominantly white females and males, were interviewed to find out about why they were not interested in the Noyce Scholarship program at Hofstra University. Interviews revealed that a considerable number of the students preferred teaching in a school environment that resembled their former middle and high schools. Moreover, these students had developed stereotypical attitudes toward high-need schools before they entered the mathematics and mathematics education programs at Hofstra University. This included the lack of intrinsic motivation among students in high-need schools, discipline problems, and lack of adequate resources. They identified media, friends, parents, and past teachers as contributing to their perceptions. However, some of the students (White females) who applied to the Noyce program indicated that they attended high-needs middle schools and they also tutored children from high-need schools. Others felt that is where they would most make a difference. The financial incentive was secondary to all the students interviewed.

3.8  Promoting Professionalism in Pre-service Teachers

Length of Session: 60 minutes

Hope Marchionda, Western Kentucky University, hope.marchionda@wku.edu
Joye Beth Spinks, Western Kentucky University, joye.spinks960@topper.wku.edu, Noyce Scholar
Tara Thompson, Western Kentucky University, tara.thompson767@topper.wku.edu, Noyce Scholar
Kathryn Crawford, Western Kentucky University, kathryn.crawford292@topper.wku.edu, Noyce Scholar

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators
Topic: Innovative Noyce Program Practices and Teacher Preparation Models

According to the Merriam-Webster Dictionary, the definition of professionalism is "the conduct, aims, or qualities that characterize or mark a profession or a professional." In this session, we will discuss what that means in the context of teaching. We will consider how the perceptions and expectations of students, teachers, administrators, and communities can affect how teachers perceive professionalism. We will then share how Western Kentucky University’s (WKU) Noyce Program seeks to promote professionalism in its Scholars as well as other preservice teachers who plan to teach in one of the STEM fields. We will also discuss some of the successes and some of the obstacles we have encountered during our efforts to promote professionalism with our first cohort of Noyce Scholars. WKU Noyce Scholars will be on hand to share their experiences from the past year and to share how they believe these experiences will impact their future careers in teaching. Participants will be invited to share how their Noyce programs are promoting professionalism to prepare better STEM teachers.

3.9  Noyce Summer Internships: A Safe Pathway Toward STEM Teaching

Length of Session: 60 minutes

Lisa Montplaisir, North Dakota State University, lisa.monplaisir@ndsu.edu
Kim S. Nguyen, IUPUI, knguyen@iupui.edu
Dwight Schuster, IUPUI, daschuster@iupui.edu

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, Non-Profit Organization Personnel
Topic: Recruitment and Marketing Strategies

Noyce Summer Internships are structured to provide meaningful experiences for undergraduate STEM majors. Interns interact with K-16 students in both formal or informal learning/research environments. The goal of the experience is to promote STEM teaching as a career and to increase the pool of Noyce scholarship applicants, especially among underrepresented minority students.
At North Dakota State University, interns are placed into laboratory or classroom environments, alongside exemplary high school juniors and seniors who are participating in the North Dakota Governor's School program. Interns at Indiana University Purdue University Indianapolis are placed in urban classrooms as math tutors or science mentors and in informal science educational settings, such as museums and science summer camps. The results of the programs at these two institutions are highly encouraging for Noyce undergraduate program recruitment and create a real possibility of increases among underrepresented minority populations in the Noyce Scholarship program.

3.10 Lesson Study for Secondary Teaching

Length of Session: 60 minutes

Terri Burke, California State University, San Bernardino (CSUB), tgibbsburke@gmail.com
Christopher Duran, CSUSB, christopher.duran@sbcusd.com, Noyce Fellows/Fellow
Angel Moreno, CSUSB, angel.moreno@sbcusd.com, Noyce Fellows/Fellow

Target Audience: Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-Pis, Other Faculty/Staff, School and District Administrators
Topic: Resources for Teachers

Lesson study originated in Japan as a method for teachers to enhance their teaching by collaboratively studying, designing lessons, and observing student learning and analyzing students’ responses to the lesson. We have been engaging in lesson study in San Bernardino City USD for the 2010-2011 school year as Noyce Fellows. Come hear how lesson study has impacted our teaching practices, the insights we have gathered about student learning and other exciting experiences we've encountered as we continue on this journey.

3.11 Discovering Science and Math Using the 5E Model

Length of Session: 60 minutes

Joye Beth Spinks, Western Kentucky University (WKU), joye.spinks960@topper.wku.edu
Tara Thompson, WKU, tara.thompson767@topper.wku.edu, Undergraduate Noyce Scholar
Kathryn Crawford, WKU, kathryn.crawford292@topper.wku.edu, Undergraduate Noyce Scholar

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows
Topic: Resources for Teachers/Innovative Noyce Program Practices and Teacher Preparation Models

With evolving standards and curriculum in the mathematics and science fields, there is a continuing push for teachers to educate students using inquiry and discovery based methods. Educators can use the 5E Model to build inquiry into their classrooms and create a student-centered learning environment. Each component of the 5E model (Engage, Explore, Explain, Elaborate and Evaluate) will be explained in-depth using example lesson plans. Each individual component will also be modeled in the presentation so that the attendees can learn about the 5E model from firsthand experience.

Participants will work in small content-based groups to brainstorm ideas for creating 5E lessons in their disciplines. Participants will leave with ideas that the groups share as well as examples of 5E lessons that have been designed and implemented in both middle grades and secondary science and mathematics classrooms. This session will allow educators to leave with a deeper understanding of how to create a 5E lesson and provide them with different ideas for incorporating science and/or mathematics content into 5E lessons in their own classrooms.

3.12 Survival Guide for the First-Year Teacher

Length of Session: 60 minutes

Kimberly Welty, University of Massachusetts Dartmouth, kwelty@umassd.edu
James Knuuttilla, University of Massachusetts Dartmouth
Michelle Pound, University of Massachusetts Dartmouth, u_mpound@umassd.edu, Noyce Scholar
Kate McDermott, University of Massachusetts Dartmouth, u_k1mcdermot@umassd.edu, Noyce Scholar

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Project PIs, Co-Pis, Other Faculty/Staff
Topic: Supporting New Teachers

Fifty percent of teachers leave the profession within the first five years. Going along with this statistic is the alarming turnover rate in urban school districts. The lack of retaining good teachers in urban schools is disappointing. One reason why this may be happening includes lack of support and information, especially for new teachers. Noyce Scholars can learn which questions to ask and what tools they can use to help prepare for their first year as teachers.
This session will provide tools and tips to help Noyce Scholars in their first year of teaching, such as, avoid negative teachers, incorporate best practices from peers, plan extra work in case the lesson is shorter than you planned, etc. We will also discuss questions that may arise within the first year, such as, "What is the discipline protocol in my school?", "What is the grading policy in my school?", "How do I call a parent?", "What are my legal obligations?", "What is the chain of command at my school?", etc.

Participants will receive information about what to expect as new teachers. They will learn the "Questions to Ask" before the first day of school, and who to present those questions to. The session will include discussions, handouts, power point, posters, and door prizes.

3.13 This session includes two 30-minute presentations.

3.13A Action Research: Analysis and Reflection of Emerging Teacher Leaders

Length of Session: 30 minutes

Leah McCoy, Wake Forest University, mccoy@wfu.edu
Lauren Schnepper, Wake Forest University, Noyce Scholar

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-Pis, Other Faculty/Staff

Topic: Teacher Leadership

Our master’s program emphasizes action research as a means for developing teacher leadership skills and dispositions in our graduates. As part of our program, each Noyce scholar is required to plan, carry out, and report an action research study involving mathematics pedagogy. These studies include in-depth review of related research as well as empirical research including data collection and analysis using quantitative and/or qualitative methodology. Early in the program, scholars study Educational Research, followed by a focused course on planning Action Research. The field-based study is then carried out during the student teaching semester. Data analysis and writing occur during the final summer of the program, and results are presented at a Research Forum and published in the ERIC database.

This session will include an overview of the action research component of the program, as well as brief results of the seven current Noyce scholars' studies, and complete description of action research study by one Noyce scholar.

3.13B Beyond Knowledge and Pedagogy: Case Study Profiles of Teacher Leadership

Length of Session: 30 minutes

Sheila R. Vaidya, Drexel University, vaidyasr@drexel.edu

Target Audience: Noyce Master Teachers, Project PIs, Co-Pis, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers

Topic: Teacher Leadership/Resources for Teachers

Our own observations (Vaidya and Paul, 2011) and also those of others (Fairbanks et. al. 2010) have noted the individual differences among the teachers we prepare. While all teachers are exposed to the same knowledge and pedagogical preparation, a small number (about 6 out of 30) distinguish themselves by their excellence. Many others become technically competent, but do not excel like those who demonstrate a deeper grasp of their work through their performance and student achievement. We believe that it is important to study these teachers to understand what it is that makes up their giftedness and what can be learned about the preparation of new teachers. We investigated their personal beliefs and theories, their vision and personal commitment, how they use their mentors to improve their teaching and their academic optimism (Wolf-Hoy, 2006).

In this presentation, we will describe case study profiles of five gifted Noyce teachers who demonstrate leadership in their profession and schools. From the case studies, we will extract critical characteristics that go beyond knowledge and pedagogy in the emergence of teacher giftedness and leadership.

3.14 Summer Internships: Experiences from the First Year

Length of Session: 60 minutes
Arlene Russell, UCLA, russell@chem.ucla.edu
Rachel Halper, UCLA, rachelmeta@ucla.edu, Current Noyce Scholar

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, Higher Education Institution Administrators, Evaluators/Education Researchers
Topic: Innovative Noyce Program Practices and Teacher Preparation Models

The UCLA Noyce Project is using the paid summer internship to recruit transfer STEM students to consider teaching careers and to provide an authentic experience in a high-need school for continuing students who have participated in the California Teach program. Student interest far exceeded the capacity last summer. This workshop will provide a forum for those with internship funding to explore and discuss their plans and activities for this new component of the Noyce program.

SESSION IV: Friday, July 8, 2011
10:35am - 11:50am

4.1 Fusion of STEM in iGEM

Length of Session: 60 minutes

Rebecca Schini, iGEM High School Division, rschini@gcsc.k12.in.us
John Rihm, iGEM, jrihm@gcsc.k12.in.us, High School Division

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, School and District Administrators
Topic: Innovative Programs/Resources for Teachers

This workshop is designed to give the teacher a detailed understanding of the iGEM competition and synthetic biology. iGEM stands for “international genetically engineered machines.” This competition has been happening in the collegiate level since 2004. John Rihm and his group has developed a way for high school students to participate in a high school division of iGEM. During the workshop, teachers will learn about synthetic biology through activities. They will engineer and build a plasmid from biological parts. This plasmid will be inserted into a “cell”. They will work with computer models to show the effects of the insertion on protein synthesis and how to problem solve when failure happens.

4.2 Noyce Partnerships: Building Connections-Developing Synergies-Adding Value

Length of Session: 75 minutes

Victor Donnay, Bryn Mawr College, vdonnay@brynmawr.edu
David Andrews, California State University, Fresno, davidan@csufresno.edu
John Keller, Cal Poly, San Luis Obispo, jmkeller@calpoly.edu
Jane Horwitz, Penn Science Teacher Institute

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, Higher Education Institution Administrators, Non-Profit Organization Personnel
Topic: Partnerships

Theories of social network analysis posit that positive and unexpected synergies will occur and social capital will increase when trusted relationships are built between previously unconnected individuals and organizations. This workshop will explore ways that partnerships between multiple Noyce programs and between Noyce programs and other STEM teacher initiatives can add value to individual Noyce initiatives. We invite session participants to share their experiences with building such partnerships and brainstorm on (i) building new partnerships that will strengthen their projects, (ii) how to develop partnerships that positively impact the entire Noyce network.

We present several examples:

- The Cal Poly Center for Excellence in Science and Math Education (CESaME) has partnered with the Science Teacher and Researcher (STAR) Program that places pre-service teachers in paid summer research internships at DOE and NASA labs (http://StarTeacherResearcher.org). Noyce Scholars are invited to participate; growing numbers are taking part (13 pre-2010, 36 in 2010, 43 in 2011) representing 25 different Noyce campuses.
- The CSU-NASA/JPL Education Collaborative (http://www.jpl.nasa.gov/education/index.cfm?page=153), led by PI David Andrews of Fresno State, ran a professional
development workshop in summer 2010 for 25 Noyce Scholars from campuses throughout the Western Region. This summer, the NASA-Noyce workshop series will continue, hosted by CEsaME at Cal Poly.

- The seven colleges and universities in the Philadelphia region that currently hold Noyce grants are partnering with the Philadelphia Education Fund to create the Philadelphia Regional Noyce Partnership with the goal of offering joint programming that complements and strengthens the offerings of the individual programs.

4.3 This session includes two 30-minute presentations.

4.3A My-Fi is Sci-Fi

*Length of Session: 30 minutes*

Michelle Mass, Arizona State University STARR Noyce Scholars, michelle.mass86@gmail.com

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows
Topic: Resources for Teachers

Interested in creating a culture of readers that love Science? This session will teach how to develop a Science Fiction/Fantasy Book Club that gets students engaged and familiar with reading Science Fiction and discussing the practical/impractical aspects of the genre. This session will provide information on how to get your hands on copies of books (through funding or collaboration with libraries) and a list of titles that your students will love. Also included will be how to run a book club and discussion questions for 5 of the most popular books with my students. This program can also be adapted for a Sci-Fi movie club, or include watching movies along with novels for deeper discussion.

4.3B Connecting Field Research about Penguins to the K-12 Classroom Using an Interactive Website

*Length of Session: 30 minutes*

Jean Pennycook, National Science Foundation, jepennycook@gmail.com

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers
Topic: Resources for Teachers

Field research is exciting and engaging, but students rarely experience it. Through the use of an interactive website and multiple classroom activities related to the research, we change that. Students learn what scientists really do, how they gather and analyze data, and what tools and skills are required to be successful as a field scientist. During the austral summer, our research team travels to Antarctica to study Adelie Penguins. Using the penguins as a hook we engage students in the research giving them an opportunity to use field journal as they gather data on the penguin families. Students record weather, date of first egg, chick hatch, length of foraging trips by the adults and how many days until the chicks fledge, comparing data between breeding pairs and breeding seasons. Pictures and individual penguin information is posted daily on the website so students can record their own data and create their own graphs. Our outreach efforts connect with over 300 classrooms exciting students about scientific research in the hopes they will continue in a STEM related educational pathway and career field.

4.4 Exploring the World of Irrational Numbers

*Length of Session: 75 minutes*

Viji K. Sundar, California State University, Stanislaus, vsundar@csustan.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers
Topic: Resources for Teachers/Teaching with Pizzaz!

The audience will journey into the world of Real Numbers. During their travel, they will encounter the Rational beings and Irrational beings. The visitors will recognize the friendly Rationals seated on the number line, even if they show up in multiple representations. Who fills the vacant places on the number line? The tour guide has the answer - the Irrationals. The audience, "all mathematicians," laugh at the creative naming of not rationals as irrationals. The tour guide, in the limited time he has, decides to bring out three of the irrationals to step forward and do their performance.

Three performers: pi, phi, and e step forward. The number pi, which closely lives with the circle and the golden ratio phi act out their geometric roots. The irrational e, who is considered as just a number by algebra 2 students, and just as a limit by calculus students, puts on an impressive show about his role in financial calculus and population growth. The next performer, phi, outdoes e with her omnipresence in nature,
art, architecture, music and the greatest creation of all, the human body. In the final act, pi and e share their common bond as transcendental numbers. As the curtain falls, all three stars, pi, phi and e, take their bow leaving audience intrigued by their stunts. If the three irrationals have so much to offer, how much more unknown mathematics is in all those “uncountably” many irrationals? The audience smiles thinking of all the unsolved problems waiting for their solutions!

4.5 Advanced Topics in High School Mathematics: Enrichment or Advancement?

Length of Session: 60 minutes

Sarah Irvine Belson, American University, sarah@american.edu
Michael Keynes, American University, keynes@american.edu
Ronald Mitchell, American University, mitchell@american.edu

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

Often pre-service courses for middle and high school mathematics teachers focus on one of two different areas: content knowledge from the mathematics departments and pedagogical knowledge from the education department. The chasm between these approaches often prevents teachers from connecting what they have learned about pedagogy and mathematics. This session examines how one school of education and a mathematics department worked together to create a two course sequence to bridge the divide.

The first course has students apply the problem solving skills they have developed in their upper level mathematics courses on material from the high school curriculum. The second course exposes students to ways that advanced mathematics applies to what they will teach in high school. Beyond establishing the connection between pedagogy and content, this sequence aims to give exposure to the high school mathematics curriculum as well as developing pedagogical content knowledge.

4.6 Providing Opportunities for Teachers to Take a Scholarly Lens Towards Designing and Implementing Research-Based Tasks

Length of Session: 60 minutes

Hollylynne Lee, North Carolina State University, hollylynne@ncsu.edu
Ayanna Franklin, NC State University, adfrankl@ncsu.edu,
Emily Thrasher, NC State University,
emily.n.plunkett@gmail.com

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Evaluators/Education Researchers

Topic: Innovative Noyce Program Practices and Teacher Preparation Models

The Noyce Mathematics Education Teaching Scholars program at NC State University aims to develop highly qualified teachers who are able to use advanced technologies and research-based strategies for teaching mathematics. We will discuss how we engage scholars in a synthesis, planning, implementation, and evaluation cycle for designing tasks for their classroom. Participants will discuss the cycle used for preservice teachers and generate ways to adopt or adapt this technique in their own institution and as a form of mentoring support with scholars who are practicing teachers.

4.7 Philadelphia Teacher Residency Induction: Strategies for Providing Continuity from Pre-service Teacher Preparation to In-service Teaching

Length of Session: 60 minutes

Diana Campbell, Philadelphia Education Fund, dcampbell@philaedfund.org
Kate Kinney Grossman, Coordinator, New Teacher - Induction
Sarah Poncz, New Teacher - Coach

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators

Topic: Supporting New Teachers

The Philadelphia Teacher Residency Noyce program produced nine Noyce Fellows in 2010, all of whom engaged in various professional support activities during the 2010-2011 school year. Activities include classroom-based coaching, monthly support dinner discussions, and an intensive summer workshop.
In this presentation, we will discuss the strengths and challenges of our professional support activities. Additionally, we will share our plans to provide continuity from the pre-service learning experience to the in-service learning experience for the second cohort of 18 of Noyce Fellows who will begin their careers this fall.

### 4.8 Noyce Kenan Master Teaching Fellows: Teaching Students to Think Outside the Book

*Length of Session: 60 minutes*

Valerie Brown Schild, North Carolina State University, Valerie_Brown-Schild@ncsu.edu  
Carrie Brewington, Kenan Fellows Program, ctskate@ymail.com

**Target Audience:** Noyce Teaching Fellows, Noyce Master Teachers, Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel  
**Topic:** Teacher Leadership

Linking corporations to K-12 education is paramount to building authentic STEM lessons in order for all students to be successful. This interactive presentation will highlight the Kenan Fellows Program and one Fellow’s lessons based on her experience working with the leadership at a DuPont plant located in Fayetteville, North Carolina. Attendees at this session will want to come prepared to listen, learn and actively participate in the session.

### 4.9 This session includes two 30-minute presentations.

#### 4.9A Planning and Hosting a Regional Noyce Conference

*Length of Session: 30 minutes*

Laura Henriques, California State University, Long Beach, lhenriqu@csulb.edu  
David Andrews, California State University (CSU), Fresno, davidan@csufresno.edu  
Jaime Arvizu, CSU Fresno, jaimea@csufresno.edu

**Target Audience:** Project PIs, Co-PIs, Other Faculty/Staff  
**Topic:** Partnership/Regional Conference Planning

Are you planning a regional Noyce conference? Want to learn tips to helping organize and run one? Along with Arizona State and Cal State Fresno, California State University, Long Beach (CSULB) is part of the leadership team for the Western Regional Noyce Conferences. CSULB hosted the 2011 conference; 250 participants attended a weekend conference with 42 workshops, two keynote presentations and a poster session. We will share our timeline for planning the conference, organizing the content and evaluation data from the event. We developed our conference on the successes of Cal State Fresno's 2010 conference. Feedback from Scholars and Fellows provide some useful tips for planners of future Noyce Conferences and events. The conference website has most handouts and presentations at wrnc2011.org.

#### 4.9B How Students Learn, a One-Credit Add-On Class and Textbook in Development for Noyce Scholars at the College of William and Mary

*Length of Session: 30 minutes*

Paul Heideman, College of William and Mary, pdheid@wm.edu

**Target Audience:** Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Project PIs, Co-PIs, Other Faculty/Staff, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers  
**Topic:** Innovative Noyce Program Practices and Teacher Preparation Models

The literature on learning indicates great unmet potential for improvements in learning based on recent findings in neuroscience, cognitive psychology, and pedagogical research. An add-on one-credit course, "How Students Learn," integrates the neuroscience of learning and memory, metacognition, and learning tools to help prospective teachers understand the science of learning as applied to their own teaching. Course sessions include segments on metacognition, chunking and working memory; cognitive load; tools that can enhance student learning; the neuroscience of learning, memory, and problem solving; information reduction; learning tools; building engagement and interest; the role of sleep in learning; and visual model development on STEM topics. Sessions on problem solving included the use of non-linguistic representation to develop explanations, hypotheses, predictions, and solve problems. Noyce Scholars have responded positively, but were united in desiring a dedicated text for the class.

In response, a text for the class with an instructor’s guide, in-class exercises, and grading rubrics is now in progress.
Support from the Jessie Ball duPont Fund will support free and open access to the completed text, guide, and other materials on a course website by Fall 2012. The text is targeted to STEM students in grade 12 and college freshmen, with the instructor’s guide for Noyce Scholars, G6-12 STEM teachers, or college faculty. The text combined with instructor’s guide and supplemental readings will be used in future offerings of our add-on course for Noyce Scholars. This presentation will outline the course and text and show sample in-class exercises and materials.

4.10 'Honey, Call the Plumber!' - Mending the Pipeline of STEM Teacher Recruitment into Noyce Programs

Length of Session: 60 minutes

Steven Fletcher, St. Edward's University (SEU), stevenf@stedwards.edu
Grant Simpson, SEU, grants@stedwards.edu
Bill Quinn, SEU, billq@admin.stedwards.edu
Cynthia Naples, SEU, cynthian@stedwards.edu
Hannah Kenah, SEU, hannahhk@stedwards.edu

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Evaluators/Education Researchers

Topic: Recruitment and Marketing Strategies

Through participation in many science education conferences in the last three years, we have repeatedly heard conversations that center on how hard it has been to recruit Noyce scholars. Our program is no different. After a disappointing return of applications despite an intensive recruitment campaign, including a summer camp and multiple level marketing campaign, we decided to design a mixed method study to examine the context and setting for our own recruitment efforts.

This session will explore factors related to the challenge of populating Noyce program cohorts with qualified scholars - both from internal recruitment efforts and from a partnering community college. The questions:

- What factors impact student interest and application to science and mathematics teacher preparation within the university?
- What factors impact student interest and application to the St. Edward's (SEU) Noyce Scholars program from both within SEU and through ACC, the partnering institution?
- What factors impact student interest and application to the NSF Noyce Scholars program at large were chosen to tease out salient themes that may uncover and clarify both positive and negative recruitment strategies within our partnership as well as help others in their own recruitment efforts?

Our hope for this session is threefold: A) to describe the results of our preliminary work in this area, B) to ask session participants to reflect and share both challenges and successes with recruiting in their own Noyce programs, and C) to invite others in the Noyce community to build a national study that examines recruitment into Noyce programs using a mixed method research framework.

4.11 The "Nuts & Bolts" of Implementing a Master Teaching Fellows Project: What We Have Learned in Two Years

Length of Session: 60 minutes

Michaele F. Chappell, Middle Tennessee State University, chappell@mtsu.edu
Kyle Butler, Middle Tennessee State University, kbutler@mtsu.edu

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff, School and District Administrators, Higher Education Institution Administrators, Non-Profit Organization Personnel, Evaluators/Education Researchers

Topic: Project Management

This presentation highlights both successes and challenges of implementing one of six Master Teaching Fellows [MTF] projects funded in year 2009. The MTF project aims to transform STEM teaching and learning by redefining STEM education professional development and building the capacity to expand our mentorship model. We carry out this goal by developing master teachers in the field; building the professionalism of classroom practice; encouraging teachers to conduct critical inquiry; and providing them with necessary tools and experiences to determine best practices in their contexts.

This session will explore factors related to the challenge of populating Noyce program cohorts with qualified scholars - both from internal recruitment efforts and from a partnering community college. The questions:

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Michaele F. Chappell, Middle Tennessee State University, chappell@mtsu.edu
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Our hope for this session is threefold: A) to describe the results of our preliminary work in this area, B) to ask session participants to reflect and share both challenges and successes with recruiting in their own Noyce programs, and C) to invite others in the Noyce community to build a national study that examines recruitment into Noyce programs using a mixed method research framework.
ics address helping all involved partners and organizations "re-think" standard practices, and finding new ways of implementing such a different kind of project.

Important elements of this project include using a mentoring model with university faculty as they guide 14 teachers to develop teacher enhancement plans focused on content knowledge, pedagogy, and/or leadership competencies. Each year, teacher professional development is being supported through teacher-directed action research. The goals, tools, and assessments of the project will be discussed. Additionally, the group will provide reflections on learning experiences, successes, and potential barriers to facilitating teacher professional development through classroom research. Handouts will be provided.

4.12 Finding the Value in eVALUation -- What a Noyce Director Should Expect from Program Evaluation

*Length of Session: 60 minutes*

Susan Tucker, California State University, San Bernardino, sutucker1@mac.com
Dauida Fischman, California State University, San Bernardino, fischman@csusb.edu

Target Audience: Project PIs, Co-PIs, Other Faculty/Staff
Topic: Research and Evaluation

Although mandatory in NSF projects, the value of Noyce program evaluation is in the eye of the beholder. This session will share strategies to increase the utility of evaluation by project directors. Using the combined perspectives of an external evaluator and a Noyce director, this session will address:

- Identifying and balancing the benefits of formative and summative evaluation;
- Using a template for negotiating a good evaluation plan: questions, indicators of success, sources of evidence, timeline, methods of data collection and analysis, interpretation of results, communicating results, and using results to make decisions about program improvement; and
- Applying strategies to build evaluation capacity for the grant in general and director in particular.

4.13 Model Lessons to Increase Student Engagement

*Length of Session: 60 minutes*

Lisa Loop, Claremont Graduate University, Lisa.Loop@cgu.edu
Maria Corona, Claremont Graduate University, mcorona088@hotmail.com
Bryan Bowens, bryan.bowens@gmail.com, Shandon Middle School, San Bernardino, CA
Young Mi Kim, Claremont Graduate University, youngmi.kim@gmail.com,

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Noyce Master Teachers
Topic: Resources for Teachers

Each Noyce Scholar will show a video clip of an engaging math or science lesson. Lesson plans will be distributed and a Q&A period will be offered after each presenter.

4.14 Facilitating Student Reflection Through Self-Assessment

*Length of Session: 60 minutes*

Constance Smith, Warner Graduate School of Education, University of Rochester, csmith@warner.rochester.edu
(Presentation developed by University of Rochester current Noyce Scholars: Stephen Johnson, (Presenter), Marshall Hunter, Harvey Williams, Molly Gildea, and Tyler Lucero)

Target Audience: Undergraduate and/or Graduate Noyce Scholars, Noyce Teaching Fellows, Project PIs, Co-PIs, Other Faculty/Staff
Topic: Resources for Teachers

Student-directed exploration holds a prominent place in the curricula of reform-minded educators. However, the conceptual shifts that constitute real learning can only take place when learners take time to consider their experiences in a broader context. As John Dewey (1933) stated, "We do not learn from experience, we learn from reflecting on experience." Moreover, recognizing the outcomes of experience can serve to reinforce the value of learning in our minds and encourage further inquiry. Life-long learners take time to make meaning from experiences through reflective practices. It follows that a teacher with the goal of cultivating life-long learners should create an instructional space that encourages students to develop reflective habits.
As pre-service teachers, we struggled to identify practices that would be most successful in encouraging student reflection in the course of our inquiry-based lessons with the goal of developing student awareness of the evolution of their understanding of scientific concepts. Here, we describe several techniques developed and implemented, and we evaluate them in light of student outcomes. One example was for students to construct responses to the unit's essential question at the end of each class in the context of what they learned that day. Another is to have students respond to an identical set of questions relevant to the content of the day's lesson at the start and end of the class. Results suggest that implementing such reflective learning practices is a complex pedagogical task requiring multiple layers of scaffolding and support.
1

Title: Goals and Preliminary Findings from the Evaluation of the Robert Noyce Teacher Scholarship Program
Principal Investigator: Ellen Bobronnikov
Email: ellen_bobronnikov@abtassoc.com
Institution: Abt Associates Inc.
Presenter(s): Ellen Bobronnikov, Abt Associates Inc., ellen_bobronnikov@abtassoc.com
Amanda Parsad, Abt Associates Inc., amanda_parsad@abtassoc.com
Cris Price, Abt Associates Inc., cristofer_price@abtassoc.com
Radha Roy, Abt Associates Inc., radha_roy@abtassoc.com

On behalf of the National Science Foundation (NSF), Abt Associates is conducting a national study of NSF’s Robert Noyce Teacher Scholarship Program. The study will document the activities, stakeholder perceptions, and outcomes for participants from all Noyce projects funded between 2003 and 2009; it will also examine the impact of the Noyce Program on teacher recruitment and retention in high-need districts and schools and on student achievement. As part of the evaluation of the Noyce Program, the Abt team will survey the census of Principal Investigators, STEM faculty, Noyce recipients, and K-12 school principals where Noyce recipients are teaching; the study will also interview a small subset of these same respondent groups. This presentation will discuss the goals, timeline, and preliminary findings of the study and will highlight the important roles that PIs and other project staff and participants will play in the study.

2

Title: Teachers of Mathematics Scholarship (TOMS): Diversity and Field Based Clinicals
NSF Noyce Award Number: 0934756
Principal Investigator: Robert Bradley
Email: bradley@adelphi.edu
Institution: Adelphi University
Co-PI(s): Dante Tawfeeq and Salvatore Petrilli
Presenter(s): Dante Tawfeeq, Adelphi University, tawfeeq@adelphi.edu
Project Discipline: Mathematics
URL(s): http://education.adelphi.edu/curriculuminst/toms.php

The Teachers of Mathematics Scholarship (TOMS) at Adelphi University seeks to develop excellent teachers of mathematics from diverse backgrounds to serve high need schools in the region. In 2010, we recruited 6 Noyce Scholars and 5 Noyce Fellows. During 2011, we are recruiting additional Scholars and Fellows. The current Noyce Scholars, all graduates of regional community colleges, came to Adelphi as juniors in a five-year BS/MA program called the Scholar Teacher Education Program (STEP). Their program includes a rigorous undergraduate degree in mathematics, with a minor in Adolescent Education, to be followed by a full year of graduate study, leading to a master’s degree in Adolescent Education and New York State teacher certification.

The current Noyce Fellows are all non-traditional masters-seeking students, pursuing an MS in mathematics education. All Fellows have earned bachelor’s degrees in mathematics or mathematics and physics. They are following an accelerated 18-month program that will lead to a master’s degree and New York State certification. Included among their courses in 2010-2011 were: 1) Issues of Learning Mathematics in High Needs Schools: Race, Equity & Social Justice; and 2) Measurement & Evaluation of School Based Mathematics Learning Programs and Testing.

Our current Noyce Scholars have coalesced into a mutually supportive community of learners, especially with regards to their mathematics content. Our Fellows, through their pre-intern field-based experiences, have become better informed about issues that impact high needs/low resourced schools. These Fellows are being prepared to successfully support the students that they will engage during their student teaching and subsequent careers.

3

Title: PhysTEC Noyce Scholars
NSF Noyce Award Number: 0833210
Principal Investigator: Monica Plisch
Email: plisch@aps.org
Institution: American Physical Society
Co-PI(s): Beth Cunningham, Laurie McNeil, Rob Thorne, and Al Rosenthal
Presenter(s): Monica Plisch, American Physical Society, plisch@aps.org
Project Discipline: Physics
URL(s): http://www.phystec.org/noyce/

The Physics Teacher Education Coalition (PhysTEC) project has a mission of improving the education of future physics and physical science teachers. PhysTEC has supported 24 institutions to build model physics teacher education programs, and has overall doubled the number of physics teachers graduating from these institutions. PhysTEC also has a coalition of 240 institutions committed to improving physics teacher education, and organizes an annual conference that attracts 120 participants. The PhysTEC Noyce project involves 6 PhysTEC supported sites, and has a
goal of further increasing the number of physics teachers who graduate from these model programs. In addition to scholarships for future teachers, the PhysTEC Noyce project provides support for Visiting Master Teachers to mentor scholars. Also the project provides summer research opportunities in physics education and professional development with research-proven curricula. PhysTEC is a project of the American Physical Society (APS) and the American Association of Physics Teachers (AAPT), with support from the National Science Foundation and the APS Campaign for the 21st Century.

4
Title: Science Teachers for AZ - Recruitment and Retention (STARR)
NSF Noyce Award Number: 0833311
Principal Investigator: Julie A Luft
Email: Julie.Luft@asu.edu
Institution: Arizona State University
Co-PI(s): Steven Semken, Associate Professor, School of Earth and Space Exploration; Mari Koerner, Dean, Teachers College; and Sid Bacon, Dean of Natural Sciences
Presenter(s): Suzanne Cassano, Noyce Specialist, Arizona State University, Suzanne.Cassano@asu.edu
Julie A. Luft, STARR Noyce PI, Arizona State University, julie.luft@asu.edu
Project Discipline: All Sciences
URL(s): http://education.asu.edu/content/robert-noyce-scholarship-program

In the Phoenix metropolitan area, the shortage of secondary science teachers is experienced by all districts. In high-need districts, this shortage is compounded by an on-going migration of teachers in these schools to schools that are perceived to be less challenging. As a result, high-need schools often experience on-going vacancies in the teaching staff and a high turnover rate of qualified teachers. Science Teachers for Arizona - Recruitment and Retention (STARR) attempts to identify and support qualified science teachers who will persist in high-need environments.

Using different recruitment tactics, science students are identified and recruited to participate in undergraduate or post-baccalaureate programs that have extensive field experiences with diverse students, strong content knowledge requirements, and on-going opportunities to develop their science as inquiry instruction. While students are completing their initial certification course work, field placements are arranged in high-need settings that consist of students who are Native American, Latina/o, or African American. Upon graduation, STARR Noyce teachers have access to ongoing assistance which specifically support their use of science as inquiry in diverse classrooms, their development as science teachers, and their socialization into the school community. Our poster will discuss our recruitment strategies, information about our teacher education programs, and the support offered to the Scholars. It will also share some data from our program that pertains to the Noyce Scholars and the STARR Noyce program.

The intellectual merit of STARR Noyce resides in the theoretical grounding of this proposal, the attention to the continuum of development of a teacher, and the potential for the dissemination of knowledge pertaining to science teacher learning. The PI and co-PIs of this project are well-grounded in the research in science and science teacher education, as well as prominent contributors to this domain.

The broader impact of qualified science teachers in the local community is limitless. Teachers supported through STARR Noyce will ultimately work with students who are most in need in terms of acquiring an education pertaining to science (e.g., students who are culturally and ethnically diverse). In addition, the funds from this program support current initiatives among faculty and staff at ASU to impact the production of science teachers. Support for teachers ultimately results in additional conversations about current ASU initiatives, as well as spurring the discussion of additional topics to be considered pertaining to science teacher education. STARR Noyce reinforces ASU’s commitment to the community by providing citizens who are able to participate in scientifically-oriented endeavors.

5
Title: The TEAM-Math Teacher Leader Academy: Fostering Mathematics Teacher Leadership through Multiple Venues
NSF Noyce Award Number: 0934821
Principal Investigator: W. Gary Martin
Email: wgarymartin@auburn.edu
Institution: Auburn University
Co-PI(s): Marilyn E. Strutchens and Stephen Stuckwisch
Presenter(s): W. Gary Martin, Auburn University, wgarymartin@auburn.edu
Georgene Morris, Millbrook Middle Junior High School, gigi.morris@elmore.al.k12.us
Project Discipline: Mathematics
URL(s): http://TEAM-Math.net

For nearly a decade, TEAM-Math (Transforming East Alabama Mathematics) -- a partnership of Auburn University, Tuskegee University, and 14 local school districts -- has worked to...
improve mathematics teaching and learning in east Alabama. A major systemic change effort -- supported with funding from the National Science Foundation (NSF) Math and Science Partnership (MSP) program and other sources -- included attention to professional development, curriculum alignment, teacher leader development, and stakeholder involvement. Over the years, the teacher leadership component was identified as a critical factor in supporting reform (cf. Authors, 2009), a finding supported by other research on teacher leadership (cf. Martinez, Firestone, & Polovsky, 2005). In the model used, the teacher leaders remained in the classroom and assumed, on top of their full-time teaching responsibilities, a role in promoting change (Lord & Miller, 2000). Duties included: (a) Work with individual teachers in classroom settings; (b) Work with groups of teachers in workshop or comparable professional development settings; (c) Work with teachers, administrators, community members or students on issues or programs that indirectly support classroom teaching/learning experiences; and (d) Work with various constituents on other emergent tasks (Lord & Miller, 2000).

As the partnership looked to sustain and extend its work, continuing teacher leadership development was identified as a priority. To meet this need, a “Teacher Leader Academy” was established. Funding from NSF’s Robert Noyce Scholarship Program allows support of 22 “master teacher fellows” at the elementary level. (Supplemental funding from the MSP supports a cadre of 14 secondary teacher leaders.) Teacher leaders already active in the partnership were selected to join the academy, allowing them to continue their duties as defined by the partnership, but with additional support, including development of advanced knowledge of mathematics and mathematics education throughout graduate coursework and development of leadership skills through quarterly meetings of the academy. Elementary fellows are completing graduate certification as an “elementary mathematics specialist” (AMTE, 2010); efforts are underway to establish this as a state teaching certification. Fellows receive a monthly stipend and support for tuition.

Participants are asked to maintain a journal documenting their growth as mathematics leaders and a log of their leadership activities to encourage their reflection on the experience and to help evaluate their progress. Initial analyses of these and other data sources, suggest that they are finding creative ways in which to influence the progress of mathematics teaching and learning in their schools, districts, and the region.

6
Title: Science Educators for Urban Schools!
NSF Noyce Award Number: 0833278
Principal Investigator: Audrey A. Friedman
Email: friedmaa@bc.edu
Institution: Boston College
Co-PI(s): Katherine McNeill and Vidya Madhavan
Presenter(s): Audrey A. Friedman, Lynch School of Education: Boston College, friedmaa@bc.edu
Project Discipline: Teacher Education: Biology/English
URL(s): bcseus.edu

Science Educators for Urban Schools! (SEUS!) will fund 22-24 scholar candidates over a five-year period to receive Master’s Degrees in Science Education in the areas of Biology, Chemistry, GeoScience, and Physics, and will place, mentor, support, and track graduates in urban high schools for a minimum of two years.

SEUS! continues to recruit, prepare, graduate, and place science teachers in urban schools across the country. In May 2011, 6 more scholars completed licensure requirements for M.Ed. in Science Education, bringing the total number of scholars to 9. During summer 2011, 7 additional scholars will begin coursework towards licensure. Thus far, all scholars have received a TELL (Teaching English Language Learners) Certificate, designating them “highly qualified” to teach English Language Learners in mainstream classrooms. Although the number of applicants for SEUS! has increased and the pool has become immensely competitive, job placement has become more difficult due to the diminishing number of positions in secondary education due to school closings, formation of public charter schools, union disputes, and a failing economy.

What has become a rich venue for recruiting scholars, however, are graduate programs in science. Students enrolled in Ph.D. and M.S. programs in science content areas have decided to pursue teaching instead of research and are coming to our program with awards for exemplary teaching and a commitment to teaching disenfranchised students.

Another pattern that pervades the current pool of applicants and scholars is extensive community-based experience in serving marginalized students during undergraduate education. Our scholars’ performance in the classroom is the most critical variable in their future hiring, and thus far, those who wish to remain in Massachusetts are being hired. What presents a new but certainly not insurmountable variable is assuring teaching positions for those who intend to return to home states to teach.
7
Title: Boston University’s Noyce Scholars Program in Mathematics
NSF Noyce Award Number: 0733762
Principal Investigator: Suzanne Chapin
Email: schapin@bu.edu
Institution: Boston University
Co-PI(s): Glenn Stevens
Presenter(s): Suzanne Chapin, Boston University, schapin@bu.edu
Project Discipline: Mathematics
URL(s): www.bu.edu/sed/neyce

Boston University’s (BU) Noyce Scholars Program in Mathematics, awarded in September 2007, is designed to respond to the critical demand for highly trained middle and high school mathematics teachers in high-need school districts in the state of Massachusetts. This program is partnering with English High School in Boston and with five high-need school districts: Arlington, Chelsea, Lawrence, Waltham, and Watertown. It provides full scholarships to qualified students. BU’s Noyce Program is built around an established Master of Arts in Teaching (MAT) degree program. A unique feature of BU’s Noyce program is the emphasis on graduate-level mathematics. Students enroll in three courses as part of their degree program including a 6-week math immersion experience through the PROMYS for Teachers program. Clinical experiences with master teachers are provided along with coursework and workshops specifically designed to support reflective teaching focused on student reasoning. In order to help Scholars prepare for teaching in high-need schools, they enroll in the course, Teaching Math in Urban Schools, as part of their degree program.

There have been 22 Noyce scholars in Cohorts I-III. Six Cohort I scholars have taught in high-need districts for the past 2 years: four as high school math teachers and two as middle school math teachers. They all plan to continue teaching in their districts next year past the two-year obligation. Four Cohort II scholars have been teaching in high-need districts in 2010-2011, and will all be returning to their teaching positions next year. Nine Cohort III scholars are graduating in 2011, and are currently looking for jobs. Two scholars have left the program (9%); one was counseled out prior to entering the teaching profession and one passed away unexpectedly. One scholar is on a leave of absence. There are 14 Cohort IV scholars entering the MAT program either in summer or fall 2011.

Scholars are connected to a robust and on-going mathematics community of teachers, mathematicians, and educators. They return to campus for the monthly Noyce Scholars Seminar Series which provides professional development activities such as exploring the teaching of slope, solving math problems, or discussing the use of challenging tasks in teaching. Other PD activities for scholars include attendance at NCTM conferences, special meetings for first year teachers, and activities during the MAT year specifically oriented toward working in high-need schools.

8
Title: Math for America Boston: Noyce Teaching Scholars Program
NSF Noyce Award Number: 0934851
Principal Investigator: Suzanne Chapin
Email: mchedister@yahoo.com
Institution: Boston University
Co-PI(s): Glenn Stevens, Steve Rosenber, and Donna Chevaire
Presenter(s): Matthew Chedister, Boston University, mchedister@yahoo.com
Project Discipline: Mathematics
URL(s): http://www.bu.edu/education/neyce/index.html

The Math for America Boston: Noyce Teaching Scholars Program builds on our current program, Boston University’s (BU) Noyce Scholars Program in Mathematics, to recruit and support math teachers for work in high need districts. This program works with Master Teachers and Teaching Fellows. Master Teachers are highly qualified and experienced secondary math teachers (middle or high school) in high need Boston area school systems who would like to become instructional leaders. Teaching Fellows are outstanding STEM graduates or professionals who wish to change careers and become teachers of math. This six-year program is a collaboration of faculty in the School of Education and the College of Arts and Sciences, the Math for America program, and seven high-need school districts.

Master Teachers must have majored in math and hold a master’s degree in a related field. They enroll part-time in a graduate degree program at BU that supports their development as leaders through an immersion experience in math and coursework focused on mathematics curriculum and professional development. This program supports 5 Master Teachers. One Master Teacher is completing her second year, two Master Teachers are completing their first year, and one Master Teacher has been on leave in 2010-11. A fifth Master Teacher will join the program in summer 2011. Master teachers receive individual mentoring to support their work in their schools. They also return to campus for the
monthly Noyce Scholars Seminar Series that they help facilitate. Master Teachers receive a stipend for five years while working as teacher leaders.

Teaching Fellows enroll in a one-year graduate program that leads to the Master of Arts in Teaching (MAT) degree and initial teacher licensure as either a middle school or high school math teacher. This program will support 12 Teaching Fellows in a program focused on deep mathematical experiences with thoughtful reflection about classroom practice. Clinical experiences and coursework are designed to support reflective teaching focused on student reasoning. Follow-up activities include workshops and seminars that keep Teaching Fellows connected to a robust and ongoing mathematical community of teachers, mathematics educators, and mathematicians. MfA Noyce Teaching Fellows are required to teach math in a high-needs district in the Boston area for a period of four years. They receive stipends while teaching in these districts. Three Teaching Fellows will start in summer 2011.

Title: Using Informal Science Education Resources to Enhance Teacher Preparation
NSF Noyce Award Number: 0934865
Principal Investigator: Edwina Branch-Smith
Email: ebranchsmith@brooklyn.cuny.edu
Institution: Brooklyn College
Co-PI(s): Deborah Shanley and Jeff Suzuki
Presenter(s): Jennifer Adams, Professor, Brooklyn College, jadams@brooklyn.cuny.edu
Christopher Vasquez, Brooklyn College, chrisleevasquez@aol.com
Project Discipline: Science Education

This is the first year of our project, and the poster will describe how informal science education programs and experiences are integrated into our Noyce project, including collaborations with the New York Hall of Science and the Prospect Park Alliance (through an OEDG grant). Through these collaborations pre-service teachers are able to observe and work with students in low-stakes environments that serve as a learning laboratory for discovering how people learn science and the kinds of resources that resonate with the pre-service teachers as education professionals. We will also discuss upcoming plans for further integration of the ISE resources with traditional coursework.

Title: Cal Poly Noyce Scholars Programs in Mathematics
NSF Noyce Award Number: 0630419
Principal Investigator: Todd Grundmeier
Email: tgrundme@calpoly.edu
Institution: Cal Poly State University San Luis Obispo
Co-PI(s): Elsa Medina
Presenter(s): Elsa Medina, Cal Poly State University, San Luis Obispo, emedina@calpoly.edu
Project Discipline: Mathematics
URL(s): http://cesame.calpoly.edu/noyce/

Our program was established in 2007, and we have awarded 26 scholarships to future mathematics teachers. In addition to providing scholarships, our program has a summer workshop component for scholars to learn about the teaching and learning of mathematics as well as issues of teaching in high need districts. A supplemental NSF grant has allowed us to pay a $500 stipend for scholars from other universities to attend our summer workshops.
The Cal Poly Science Noyce Scholars Program represents one of several campus efforts to recruit, prepare, and retain high quality STEM educators at Cal Poly San Luis Obispo. The program successfully recruited 10 scholars into its initial 2009-10 cohort and 13 scholars into the second 2010-11 cohort. With an additional 15 scholarships to be awarded in the upcoming 2011-12 academic year, the program is on track to reach its target of 55 scholarships over the lifetime of the grant. During this past academic year, enrichment activities included monthly seminars on topics including diversity, modeling science pedagogy, classroom management, and needs of special education students. The cohort also selected Doug Gibson, a former Cal Poly engineering undergraduate and recent graduate from the Sonoma State credential program, as the 2011 Cal Poly Noyce Distinguished New Teacher. Gibson provided the keynote address at the 3rd Annual Noyce Narrative Event, which is intended to spread awareness of the Noyce Scholar Program and the importance of placing highly qualified science and math teachers in high need settings.

This summer, Cal Poly will host the NASA Noyce Summer Institute which will bring 25 Noyce Scholars from around the country together for a week long professional development workshop featuring NASA educators and scientists (http://www.cesame.calpoly.edu/nasa.html). The program focuses on Earth and Space science topics linked to state and national K-12 standards and emphasizes application of many free online resources provided by NASA and the National Science Digital Library. Additionally, we are planning to partner with the Cal Poly Upward Bound program this summer and through the remainder of the grant to provide additional early field experience opportunities for our Noyce Scholars. Finally, this summer 8 Cal Poly Noyce Scholars will participate in summer research at national laboratory facilities through the Science Teacher and Researcher (STAR) Program (http://www.StarTeacherResearcher.org).

The Science Teacher and Researcher (STAR) Program offers Noyce Scholars the opportunity to follow a dual “teacher-researcher” career path. Founded and implemented by the Cal Poly Center for Excellence in Science and Mathematics Education (CESaME) on behalf of the California State University (CSU) system, STAR provides paid cutting-edge research experiences that are complemented by weekly science education workshops. Successful applicants are matched with mentors at Department of Energy, NASA, and other leading research lab facilities thereby allowing them to be involved in conducting original research. Immersing Scholars in the research community promotes development of an enhanced scientific identity and better understanding of the nature of science and research. The experience is framed as professional development that prepares Scholars to become more effective teachers. This program has been made possible through funding provided by the Stephen Bechtel Fund and the NSF Noyce Scholars Program (DUE 0952013).

Since 2007, STAR has supported 223 research experiences for 180 participants representing 33 campuses. A total of 16 research facilities have hosted STAR Fellows. In the summer of 2010, STAR expanded nationally with funding from the Noyce Scholars Program to place 59 Fellows in California and 12 in new lab partnerships in Colorado, Maryland, Tennessee, and Washington. The program has provided a total of 94 summer research experiences for Noyce Scholars and, in 2011, is supporting 45 current or recent Noyce Scholars. Noyce PIs from six campuses, with high representation in the program, have requested supplements to their awards in order to support participant stipends. Through ongoing collaboration with other Noyce PIs, and continued pursuit of other funding sources, STAR is expected to maintain the program at its current level.

Evaluation results from previous summers, indicate that the program has recruited high quality science and math majors into the teaching profession, positively impacted fellows’ attitudes and beliefs about the nature of science toward
views that better match expert views, and enhanced fellows’ confidence in their ability to teach and affect change in students. A recent survey indicates that 84-89% of past participants remain committed to a career in teaching. Currently, the program is planning a study to explore the impact of STAR on the teaching practices of in-service alumni.

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Title: California State Polytechnic University, Pomona’s Robert Noyce Scholarship Program: Building a Community of Learners
NSF Noyce Award Number: 0934964
Principal Investigator: Nicole Wickler
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Institution: California State Polytechnic University, Pomona
Co-PI(s): Christine Latulippe, Laurie Riggs and Homeyra Sadaghiani
Presenter(s): Laurie Riggs, Cal Poly Pomona, lriggs@csupomona.edu and Nicole Wickler, Cal Poly Pomona, nizwickler@csupomona.edu
Project Discipline: Mathematics and Science
URL(s): http://www.csupomona.edu/~noyce/

The Robert Noyce Program at Cal Poly Pomona began in 2004/05 academic year with the appointment of an advisory board that included faculty from Math, Science, Engineering, and Education, staff from financial aid, representatives from three local school districts, and partners from industry. The first round of Scholars was selected in 2005. We have supported 43 math and science Scholars while developing a learning community and support system. The current project has expanded to include the Colleges of Science, Agriculture, Engineering, and Education, and the student groups - Science Council, Engineering Council, and Agriculture Council. It has the HR directors from local school districts on the advisory board and participating in seminars. We have leveraged other grant funds to expand support to Scholars and connect with other Noyce projects in the western states. Regular seminars include undergraduate students, graduate students, beginning teachers, and mentor teachers. As we continue to develop our community of learners we will work to focus on early recruitment of math and science majors. Data on successful conferences and seminars will be presented.

15
Title: California Coast Noyce Scholars
NSF Noyce Award Number: 0934703
Principal Investigator: Jeffrey White
Email: jww12@humboldt.edu
Institution: California State University Channel Islands, Humboldt State University, California State University, Monterey Bay
Co-PI(s): Jeanne Grier, CSUCI, Dale Oliver, HSU, and Hongde Hu, CSUMB
Presenter(s): Jeanne M. Grier, California State University Channel Islands, jeanne.grier@csuci.edu
Project Discipline: Mathematics

The Departments of Mathematics, Science, and Education at three California State University (CSU) campuses that have strong undergraduate programs in science, technology, engineering, and mathematics (STEM) and a significant commitment to teacher preparation have come together in a unique project aimed at increasing preparation of math teachers for high-need schools in underserved regions. The project establishes the California Coast Noyce Scholarship (CCNS) partnership among these three CSU campuses: Humboldt State University (HSU), CSU Channel Islands (CSUCI), and CSU Monterey Bay (CSUMB), in order to double preparation of outstanding math teachers.

The strategies of this Noyce partnership are unique, addressing the fact that the lead campus, HSU, has many undergraduates in STEM majors interested in teaching careers but is located in the north coast region of the state, with limited demand for new teachers. The other two institutions are (1) CSUCI, located west of Los Angeles and serving primarily Ventura, Los Angeles, and Santa Barbara Counties, and (2) CSUMB, south of San Francisco, serving Monterey, Santa Cruz, San Benito, and surrounding counties. They are in two of the highest-growth regions in the state and these institutions are not able to meet the large local demand for mathematics teachers. Through this partnership, undergraduate Noyce Scholars will be able to complete a STEM degree at any of the three campuses, transfer seamlessly to one of the other partner campuses for their teaching credential, and continue as a Noyce Scholar during their post-baccalaureate teacher certification (credential) program. The pathway will typically be from HSU to CSUCI and CSUMB to prepare Noyce Scholars for the teacher-shortage regions the campuses serve.

Noyce Scholars on each campus complete a rigorous undergraduate mathematics program and teacher certification program. The CCNS project will be an integral part of the mathematics major on each campus and will include significant support for Scholars as undergraduates and during their teacher credential program. The three campuses collaborate in an ongoing basis on common projects and through continuous interaction in an online Noyce Scholars Teaching Commons. In addition, they jointly host an annual conference for the Noyce Scholars on the
three campuses to meet one another, learn together, share ideas and practices, and become part of a community that will continue as they begin their teaching careers.

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Title: Teaching Excellence in Math and Science (TEMS)
NSF Noyce Award Number: 0733758
Principal Investigator: Brandi Aranguren
Email: baranguren@csuchico.edu
Institution: California State University, Chico
Presenter: David Kagan, CSU, Chico
Co-PI(s): Deborah Summers and Deidre Sessoms
Project Discipline: Mathematics and Science
URL(s): http://www.csuchico.edu/cmse/csu_chico_students/noyce_scholar.shtml

The emphases of this collaborative project vary across each of the campuses. Chico State, which serves primarily rural Northern California, is working with undergraduates in mathematics and science to develop a pipeline of highly qualified middle and secondary teachers for Northern California. Sacramento State, centered in an urban area, is endeavoring to entice career change professionals into math or science teaching.

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Title: Noyce Scholars Program (NSP) at California State University, Dominguez Hills
NSF Noyce Award Number: 0833206
Principal Investigator: Kamal Hamdan
Email: khamdan@csudh.edu
Institution: California State University, Dominguez Hills
Presenter(s): Kamal Hamdan, California State University Dominguez Hills, noycescholars@csudh.edu
Project Discipline: Education, Math, Science

NSP is funded by the National Science Foundation (NSF). Its purpose is to increase the number of highly qualified math/science teachers in hard-to-staff schools and to increase diversity in math & science majors. This is a grant that will provide up to $10,000 per year to eligible upper division math or science majors enrolled in CSU Dominguez Hills. It will also monitor students to enable them to focus on their studies, maintain their grades, stay in school, complete their degree on time, and become successful math/science teachers. Community college transfer students are eligible once they transfer to CSUDH as math or science majors and are considered juniors. NSP is a partnership between the School of Education (SOE), College of Natural & Behavioral Sciences (CNBS), Outreach, Compton USD, Inglewood USD, Los Angeles USD, & Lynwood USD (high-need secondary schools). A major distinction in the Noyce Scholars Program at CSUDH is the participation of Noyce Scholars as instructional assistants in math or science classrooms. They gain valuable hands-on experience in the classroom. In addition to classroom experience, Noyce Scholars are highly encouraged and informed of math and science internship opportunities, so they can also have rich field experiences that they can transfer into the classroom. Our current Noyce Scholars who are completing their first year of teaching have had a successful year due to their experiences with the program. We have several Noyce Scholars who will become teachers of record in the spring; we know they will also have great success! Once Noyce Scholars complete their undergraduate degree, they will either enter one of two programs, either the Transition to Teaching (TTT) Program or the Urban Teacher Residency (UTR) Program at CSUDH which helps in placement assistance with partner schools and provides participants with financial assistance and ongoing support.

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Title: Noyce Programs at the California State University, East Bay
NSF Noyce Award Number: 0833348
Principal Investigator: Kathy Hahn
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Institution: California State University, East Bay
Co-PI(s): David Stronck
Presenter(s): David Stronck, California State University, East Bay, david.stronck@csueastbay.edu
Project Discipline: Science Education

The California State University, East Bay provides the Robert Noyce Scholarship Program to enhance science and math education in K-12 schools in Alameda and Contra Costa Counties and to increase the number of science and math students who obtain teaching credentials. Funding will have supported the program from 2008 through 2012. Phase I Noyce Scholarships will be used to attract academically successful community college transfers, senior mathematics and science majors and STEM professionals to become highly effective teachers in urban school districts. In 2010-2011, 12 students have Noyce scholarships at $10,000 during this year. The program includes a professional support network and mentoring. In 2009, the Noyce Fellowship program was added. Now the College of Science and the College of Education and Allied Studies at CSU, East Bay, the Alameda County Office of Education, the Stephen D. Bechtel Jr. Foundation, and the Edward Teller Foundation collaborate on the goal of increasing the number of highly qualified science and math
Title: Fresno State Teaching Fellows (FRESTEF) Program

NSF Noyce Award Number: 0934967
Principal Investigator: David M. Andrews
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Institution: California State University, Fresno
Co-PI(s): Frederick Zechman, Carol Fry Bohlin, and Lance Burger
Presenter(s): David M. Andrews, CSU Fresno, davidan@csufresno.edu
Jaime Arvizu, CSU Fresno, jaimea@csufresno.edu

The FRESTEF Program builds upon the solid foundation of the California State University (CSU), Fresno Robert C. Noyce Scholars Program I & II. CSU, Fresno and its Science and Mathematics Education Center has a long track record of successful implementation of STEM Education programs. The program is housed in the Science and Mathematics Education Center (SMEC) in the College of Science and Mathematics.

The FRESTEF program is increasing the pool of highly qualified science and mathematics teachers in the Central Valley through a comprehensive design requiring Fellows to complete either a Master of Arts or Master of Science degree in one of the sciences, or in mathematics, in conjunction with completion of requirements for a secondary school teaching credential. This structure builds excellent bridges between pedagogy and advanced STEM content. The program builds upon the strong foundational components of two successful CSU Fresno Noyce programs (Noyce I, II) in the areas of recruitment, retention, special programmatic support including seminars on teaching in high needs schools, and opportunities for summer research within established programs at the U.S. Department of Energy Labs and NASA Centers. Our Fellows are members of a growing on-line learning community, developed under a separate initiative through the National Science Digital Library (NSDL) project by the National Science Foundation. The project leadership team includes STEM and education faculty, as well as school district experts in science or math education.

The FRESTEF program supports the preparation and credentialing of an additional 18 (this target has been achieved) of highly trained future science and mathematics teachers who are also expected to become key role models and leaders in their school districts. The project places emphasis on increasing the pool of minority science and mathematics teachers to better reflect the demographics of the region. Through extensive involvement of FRESTEF with the NSDL/Noyce Commons on-line community, the products of the Fellows program (including contributions in the form of on-line publications, lessons, and other teaching and learning resources) will be widely disseminated throughout the Noyce community in California. It is anticipated that this program will further strengthen efforts at Fresno State to close a significant and growing achievement gap among learners in science and mathematics in our K-12 schools.
The Fullerton Mathematics Teacher and Master Teacher Fellows project will develop a group of mathematics teacher leaders and mathematics teachers who will work together as master/student teachers, mentor/mentee teachers, current and future district and community leaders, and current and future college/university liaisons in high-need districts in the greater Orange County, California region. Faculty from CSU Fullerton and Santa Ana College will provide leadership for these efforts. The project has selected ten (10) Master Teaching Fellows (MTFs) who are mathematics teachers from two partnering high-need school districts, Anaheim Union High School District and Norwalk-La Mirada Unified School District, at the middle school and high school levels. The MTFs will be supported in working toward National Board certification in mathematics with the help of our non-profit partner, the National Board for Professional Teaching Standards.

The project will also select two cohorts of ten (20 total) Teaching Fellows (TFs) in mathematics who will partner with the MTFs as student teachers in their classrooms while earning their credential and Master degree and continue to collaborate as colleagues once they obtain teaching positions.

Project MT2 includes recruitment, retention, special programmatic support, such as seminars on teaching in high-need schools, and exemplary summer institutes. This provides experienced and novice mathematics teachers with high quality, research-based instructional strategies, and advanced mathematics content knowledge.

Although only in its first year, the project’s MTFs have participated in several professional activities including: a) an inter-distict observation walk-through during which Anaheim district teachers visiting the schools and classrooms of their Norwalk-La Mirada district counterparts and all MTFs debriefed after lunch to share what was learned; b) a presentation at the Noyce regional meetings in southern California in March; c) a presentation at the NCTM annual conference in Indianapolis in April; and d) a Career Day presentation at CSU Fullerton in May.
The Improving Mathematics, Physics, and Chemistry Teaching (IMPaCT) program, is designed to support talented, low-income, prospective secondary school mathematics, physics, and chemistry teachers during the year they work towards their teaching credential. Each year, the program awards stipends to students who have earned a Bachelor's degree in mathematics, physics, or chemistry and who have been admitted to the teacher education program, intent on earning a secondary school teaching credential. During the four years of the grant, a total of 40 students will participate in the project. California State University, Fullerton (CSUF) houses the largest teacher-credentialing program in Orange County. IMPaCT operates within the current Secondary Credential program to actively recruit and fund minority candidates, especially Hispanics, to enter the fields of mathematics, physics, and chemistry teaching. In turn, these teachers will serve as role models to the large minority population in our public high schools and encourage more of these students to attend college and eventually enter the teaching field.

The IMPaCT program is coordinated with the school district partners within an ongoing NSF Mathematics and Science Partnership (MSP) program at CSU Fullerton, called TASEL-M (Teachers Assisting Students to Excel in Learning Mathematics) and its Phase II continuation, TASEL-M2, two state math/science partnerships, and a CPEC funded grant called CoAST (Continuum for the Advancement of Science Teaching). As a result, candidates who are awarded stipends are placed in schools where a strong working relationship exists between the CSUF mathematics, physics, and chemistry faculty members and their cohort teachers in the participating schools. Through existing professional development programs, the prospective teachers receive professional development in mathematics and physical science content and pedagogy alongside practicing teachers (seven days in the summer and five days during the academic year).

Progress of stipend awardees will be followed over the five years of the IMPaCT grant to determine the effect of the program on new teachers and to assess their impact as role models in the schools where they are employed. So far, 31 students have been awarded the scholarships (see the website for testimonials and follow-up information– http://webcert.fullerton.edu/sa/impact/Testimonials.html).

The California State University, Long Beach Noyce II project is completing its second year of scholars, with 10 actively funded scholars during the 2010-2011 academic year. Scholars participated in the service learning component of the program in our partner high need districts. Two scholars successfully completed their credential program in the Fall semester. Both have since been hired at high need high schools. Six scholars are currently in the process of student teaching in our partner school districts, four are science and two are mathematics. Our incoming cohort of thirteen new Noyce Scholars will join our two continuing Scholars in Fall 2011.

Our goal is to provide tools and experiences which will enhance student preparation for teaching in high needs schools. We have a three-pronged approach. Each scholar:

1. Receives individualized mentoring, both career and academic.
2. Engages in early field work experiences at our partner school districts: Long Beach Unified School District and Whittier Union High School District.
3. Participates in our year-long bi-monthly professional development seminar series, which aims to develop their professional skills while also contextualizes their early field work experiences in our partner schools.
Scholar’s Success through Noyce: Through these professional development opportunities, we have seen growth in scholar confidence as teachers, their reflective abilities and their emergence as young professionals. Many Scholars take advantage of additional professional development opportunities. Three scholars attended a two-week NASA workshop at CSU-Fresno last summer. They then led a seminar to train the rest of the cohort on MERLOT and the MERLOT content builder. Other professional development includes NASA-Dryden Space Program, Forestry Institute, teaching at Young Scientists Camps, and working with Upward Bound. Three of the Scholars attended the California Science Teachers Association conference in Fall 2011. Besides presenting to each other, current Noyce Scholars have presented at the annual conferences of the National Science Digital Library and National Science Teachers Association. Noyce I alumni continue to be involved, attending the Western Regional Noyce Conference and serving as guest presenters at Noyce events and teacher-hosts for Noyce Scholars during field work.

TFs participated in “job embedded” professional development activities based on the Student Improvement Through Teacher Empowerment (SITTE) approach, is a model through which TFs, during their student teaching and together with their master teachers and colleagues, conducted daily examinations of student understanding to inform instruction for the following day. TFs focused on addressing the learning needs of their students and getting through to them, rather than simply getting through a book. TFs also participated in CSUN’s weekly Noyce seminar and attended monthly meetings with MTFs.

Fellows were supported to attend the fall California Mathematics Council-South Conference in Palm Springs, the 2011 UCLA Curtis Center Mathematics and Teaching Conference, which included a keynote by Bill McCallum on the Common Core State Standards for Mathematics, and the Western Regional Noyce Conference in Costa Mesa, CA.

In the fall, the program for TFs was modified to allow for two master’s degree tracks in mathematics and mathematics education. The mathematics education option was added because TFs found the single subject credential program to be extremely time-consuming, permitting little time to focus on graduate courses. This change allows current and incoming TFs to earn their master’s degrees after their credentials.

Recruitment of the remaining 9 TFs is underway. Various publicity efforts include a CSUN press release, an article in CSUN’s Daily Sundial, and an advertisement placed with Collegerecruiter.com. Through this program a community of CSUN faculty, local teacher leaders, and preservice teachers is developing and having a positive impact on CSUN’s preservice teachers majoring in mathematics.
The Noyce Scholarship Program at California State University, Northridge (CSUN) is now in its fourth and biggest year yet with 10 math and 10 science scholars. In math there were 5 new undergraduates and three 5th-year credential students. There were 6 new science scholars representing all of the sciences: 6 in biology, 2 in geology, 1 in biology/chemistry, and 1 in biology/physics. Eight science scholars are currently in the credential program, student teaching, and applying for jobs.

All scholars participated in year-long weekly seminars. The math seminar focused on creative approaches to teaching mathematics and engaging students. Scholars read articles by Martin Gardner and Vi Hart and presented activities during seminar. Discussions benefited from scholars’ current field experiences and participation from CSUN’s Noyce-funded Teaching Fellows. Invited guests included experienced teachers who gave hands-on presentations on algebra tiles and classroom management. A Pi-Day celebration had scholars presenting activities they could use with secondary math students. Topics ranged from writing pi-embedded poems to a hands-on Buffon’s needle experiment. Scholars were supported to attend the fall California Mathematics Council-South Conference in Palm Springs and the 2011 UCLA Curtis Center Mathematics and Teaching Conference, which included a keynote by Bill McCallum on the Common Core State Standards for Mathematics.

In the science seminar, scholars focused on ways of teaching to diverse student types in high school classrooms by reading research articles on such topics. In the spring, each scholar presented a ‘mini lesson’ starting with an engaging probe using Paige Keesey’s series on Uncovering Student Ideas in Science Volumes 1-4. These lessons would then fueled a discussion on ways of teaching the content presented. Scholars helped organize and run an Earth Day event for nearly 300 middle/high school students who came to CSUN on a Saturday to participate in a round robin of hands-on science workshops. Scholars were supported to attend the National Science Teachers Association Conference this spring in San Francisco.

Of the 7 math scholars who graduated on or before Fall 2010, 3 currently have secondary math teaching positions and 3 are looking for positions. Recruitment efforts continue to develop; the program has grown in reputation due to word of mouth, advertising, and personally inviting students to consider applying.

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Title: **CSUSB Teaching and Master Teaching Fellowships**

NSF Noyce Award Number: 0934761
Principal Investigator: Davida Fischman
Email: fischman@csusb.edu
Institution: California State University, San Bernardino
Co-PI(s): Carol Cronk, Sheree Jederberg, and Joseph Jesunathadas
Presenter(s): Carol Cronk, San Bernardino County Superintendent of Schools
Project Discipline: Mathematics
URL(s): noyce.csusb.edu

The CSUSB Noyce Teaching and Master Teaching Fellowships program addresses local challenges by developing, implementing and evaluating a comprehensive professional development program in mathematics education that will result in improving the quality of instruction, and ultimately increasing student achievement among secondary students in the SBCUSD.

The CSUSB Fellowship program will ultimately include 20 Teaching or Master Teaching Fellows. All Fellows will earn a Master of Arts in Teaching Mathematics at CSUSB. It is our experience that most Masters’ degrees earned by teachers in our service area are not specifically content-related, but rather focus on general curriculum and instruction or on administration; thus this degree will significantly enhance the depth and breadth of mathematical content knowledge as well as content knowledge for teaching among the Fellows.

During the five-year Fellowship, Teaching Fellows and Master Teaching Fellows engage in lesson study as a team. The team has ten formal days to meet with a facilitator during the regular school day, to study mathematical concepts and prepare, teach, and debrief lessons. However, in addition to the designated lesson study time, the teachers frequently meet together on their own time to share strategies, do homework, and plan lessons for lesson study.

The Fellows are so excited about the lesson study process that they requested to attend the Chicago Lesson Study Conference in May 2011, and the Noyce Fellowship program supported them. They have also shared their lesson study expertise with the larger Noyce community in a presentation at the Western Regional Noyce Conference, and have proposed a session at the Annual Noyce Conference in July. As a result of the parallel processes of engaging in study for a master’s degree and ongoing lesson study, the Fellows are becoming a supportive and productive community of teachers focused on enhancing all aspects of their teaching.
The Professional Learning Community of Fellows is already expanding its influence in the district. Several have decided to apply for National Board Certification, and have included colleagues from their schools to join them. Others are bringing to their Department meetings ideas and strategies they have learned in the lesson study sessions and in the MAT program.

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Title: CSU San Bernardino Noyce Math and Science Scholarships Program
NSF Noyce Award Number: 1035229
Principal Investigator: Davida Fischman
Email: fischman@csusb.edu
Institution: California State University, San Bernardino
Co-PI(s): Joseph Jesunathadas, Carol Cronk, and Sheree Jederberg
Presenter(s): Davida Fischman, CSU San Bernardino
Project Discipline: Mathematics and Science
URL(s): noyce.csusb.edu

The major components of the CSU San Bernardino Noyce program are mentored classroom experiences (2 full weeks in the beginning of the academic year and weekly thereafter), monthly seminars for scholars and mentor teachers, supervision of Noyce scholars’ student teaching by subject-matter faculty, and academic advising by Natural Sciences as well as Education faculty. All of these are firmly grounded in a strong partnership between the CSUSB College of Natural Sciences, College of Education, the San Bernardino County Superintendent of Schools, and the San Bernardino City Unified School District.

Additionally, we encourage and support financially scholars’ attendance at local and regional meetings and conferences such as the Riverside-San Bernardino Counties Math Teachers Association Dinner Meetings, the Western Regional Noyce Conference, and the California Math Council ? South Annual Conference.

Structured mentoring experiences are at the core of our program; these are particularly valuable since our Noyce scholars are primarily undergraduates who have had little or no experience in the classroom. For this component of the program, our partners collaborate to identify lead teachers in the district who have outstanding skills both in teaching secondary students and in working with adults. The mentors and scholars are then matched, based on perceived needs of the scholars and skills of the teachers. During the three years of the Noyce program, the scholar progresses through a series of benchmarks: at first the scholar observes classroom activities with a specific focus and records them, and then over time progresses from individual ad hoc tutoring to working with small groups, then co-planning and teaching portions of lessons, and eventually to independent planning and teaching of lessons under the supervision of the mentor teacher.

The Noyce seminars provide scholars and mentor teachers with additional opportunities to learn from university and district experts. Topics of particular interest have been a series of sessions on classroom management, formative and summative assessment, making good use of teaching resources to teach conceptually, and standards-aligned teaching with understanding. These will be expanded in the upcoming years to include implementation of Common Core State Standards.

Many scholars have said that without the Noyce-sponsored mentored and structured classroom experiences and the confidence they gain through them, they would not have made the decision to become a teacher. Others have said that their first-year teaching is immeasurably more successful than it would otherwise have been, after having learned so much about teaching in all its aspects from their mentor teachers and through the Noyce seminars and conferences they have attended. Feedback from district personnel indicates a high level of satisfaction with the work of the Noyce teachers.

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Title: Central Washington University Robert Noyce Scholarship Program Science and Mathematics Alliance for the Retention of Teachers (SMART)
NSF Noyce Award Number: 1035514
Principal Investigator: Martha J. Kurtz
Email: kurtzm@cwu.edu
Institution: Central Washington University
Co-PI(s): Tim Sorey, Chris Black, Rexton Lynn, and Leslie Elsaessner
Presenter(s): Martha J. Kurtz, Central Washington University, kurtzm@cwu.edu
Vanessa Hunt, Central Washington University, huntv@cwu.edu
Project Discipline: Biology, Chemistry, Earth Science, General Science, Physics, Mathematics, and Middle Level Math and Science
URL(s): http://www.cwu.edu/~cesme/noyce.html
In response to a regional and nationwide teacher shortage in secondary science and mathematics, Central Washington University (CWU) in partnership with five community colleges initiated a Phase I NSF Noyce Scholars Program to recruit and train STEM majors and STEM professionals to become science and mathematics teachers in high need schools. Over five years, 44 SMART Scholars will be prepared to teach science and mathematics in high needs school districts and 70 SMART Affiliates will participate in teaching, research, or academic service learning experiences. High priority is placed on recruiting students underrepresented in STEM fields. In the first year of funding, the Affiliate program was initiated with two experiences. Affiliates were selected to participate in an 80-hour summer camp teaching experience and/or a 160-hour summer research experience. The research Affiliates will participate in four, week-long research experiences. In addition, recruiting and marketing materials were developed and distributed to community college partners. Scholars were selected for the 2011-2012 academic year and will begin their experience with a 3-day summer institute in August 2011.

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Title: A Middle School Teaching Experience Designed by Noyce Scholars
NSF Noyce Award Number: 0833251
Principal Investigator: Andrea Van Duzor
Email: agay@csu.edu
Institution: Chicago State University
Co-PI(s): Karel Jacobs, Rita Koziarski, and Mel Sabella
Presenter(s): Karel Jacobs. Chicago State University.
kjacobs@csu.edu
Project Discipline: Biology, Chemistry and Physics

“Readings in Science Education” is a 1 hr credit course created as part of the Chicago State University (CSU) Noyce Scholars program in which students discuss science education and research papers and augment their discussions with online exchanges. Each Spring, students in the course engage in a middle school teaching experience in which they design and implement an inquiry-based science lesson for elementary or middle school students.

In addition, students must prepare pre- and post-test questions for the lesson and a reflection essay that is included in the course grade. Providing this type of early, low stress teaching experience for pre-service teachers is an essential piece of the CSU Noyce Program. Two lessons have been completed to date: one involving color given to 6th graders in 2010, and another on density given in 2011 to 4th graders. For the first lesson, scholars were assigned to teams of two and designed 3 mini lessons that were repeated in stations to one-third of the class at a time. Two Physics students created a mini lesson on primary and secondary colors and asked children to predict outcomes of mixing paints. Two Chemistry students developed a lesson on acids and bases and had children test the pH of liquids based on a color change in cabbage juice indicator. The Biology and Biochemistry Scholar’s lesson had children extract the photosynthesis pigment, chlorophyll, from spinach and view it fluoresce under UV light. The 2011 experience was designed by the Scholars to be taught to an entire class and followed more closely a lesson plan format with engagement, exploration and explanation segments. Scholars elected to work individually rather than in teams. The engagement segment asked children if items would sink or float and was followed by three exploration activities in which children had to predict and test flotation of solids and liquids. A final explanatory segment used questioning and discussion to reinforce the relationship between mass, volume and density.

In 2010, the pre- and post-test data were not addressed directly in reflection essays. Instead, scholars highlighted the value of the color lesson as a first teaching experience and specific benefits of repeating a lesson three times to small groups which allowed them to adjust their practice as needed. The pre- and post-test data from 2011, more directly informed Scholar reflections. The essays noted many children were familiar with the concept of density prior to the lesson, but they did not understand how it related to mass and volume even after the lesson was completed. A review of the experience over two years suggests that as instructors we could improve the educational value for the Scholars by requiring collaboration and including instruction in the “Readings” course on how to develop and analyze pre- and post-tests.

30
Title: The Claremont Colleges Collaborative for Math and Science Education: Successful Recruitment, Preparation and Retention
NSF Noyce Award Number: 0532064
Principal Investigator: David Drew
Email: david.drew@cgu.edu
Institution: Claremont Graduate University
Co-PI(s): Darryl Yong
Presenter(s): Lisa S. Loop, Claremont Graduate University, lisa.loop@cgu.edu
Project Discipline: Math, Science, Education

During the final year of our Phase I Noyce Grant, we recap our student recruitment, performance, placement and
Title: Robert Noyce Mathematics Scholars Program for Teachers (MSPT)
NSF Noyce Award Number: 0630339
Principal Investigator: Bettye M. Clark
Email: bclark@cau.edu
Institution: Clark Atlanta University, Atlanta Public Schools,
Co-PI(s): John King and Alexander Fluellen
Presenter(s): John King
Project Discipline: Mathematics
URL(s): www.robertnoycemspt.ca.edu

The Clark Atlanta University NSF Robert Noyce Mathematics Scholars Program for Teachers (MSPT), awarded in January 2007, is a Phase I proposal in collaboration with Atlanta Public Schools Fulton County Schools. The MSPT provides scholarships to Senior STEM majors (Track I) and STEM Professionals (Track II) to complete the Master of Arts in Teaching (MAT) Degree Program for Secondary Teacher Certification in Mathematics. The MAT Degree allows STEM majors to enter the teaching profession at a higher pay scale than the traditional BA or alternative teacher preparation programs. This Project addresses the critical need to increase the number of “New Era” teachers, especially minority, with strong mathematics content knowledge and effective classroom management and pedagogical skills for diverse populations in high need schools. The integration of research and technology is a common theme of the MAT program. The MSPT will implement a follow-up strategy to provide assistance and support to beginning teachers in collaboration with the partnering schools. The project is guided by an advisory board charged to assist in the assessment of the effectiveness of the MAT program in recruiting and preparing teachers for high need school districts. The poster presentation for MSPT addresses the mission of the Project, various aspects of the recruitment process (including the application, brochure, flyers, and “Meet and Greet” sessions), the MAT program of study and the list of Scholars in the program.

Title: 2011 Southeastern Regional Noyce Conference: Promoting Collaboration
NSF Noyce Award Number: 0733711
Principal Investigator: Lienne Medford
Email: lienne@clemson.edu
Institution: Clemson University
Co-PI(s): Barbara Speziale
Presenter(s): Lienne Medford, Clemson Universtiy,
Jamario Twitty, Clemson University, jamariot@yahoo.com
Project Discipline: Middle Grades Math and Science

Clemson University hosted the 2011 Southeastern Regional Noyce Conference for six states. Twenty universities participated and 150 attendees participated in workshops, a poster session, and listened to featured speakers. The occasion provided an opportunity for collaboration among schools and grants.

Title: Explore STEM Teaching with the CSUTeach Program
NSF Noyce Award Number: 0934842
Principal Investigator: Joanne E. Goodell
Email: j.goodell@csuohio.edu
Institution: Cleveland State University
Co-PI(s): Debbie Jackson
Presenter(s): Rick Walton, CSUTeach Master Tacher,
Department of Teacher Education, College of Education and Human Services, Cleveland State University,
r.a.walton51@csuohio.edu
Project Discipline: Math and Science Teacher Education
URL(s): http://www.csuohio.edu/cehs/departments/te/noyce.html

This program provides STEM students both content degree in mathematics, physics, biology, or chemistry, and teaching licensure. This new program streamlines pedagogy coursework with science and mathematics content. While this new model for teacher preparation breaks with the traditional college of education program, it retains all of the important features including research-based theories for delivering content in the urban classroom, including culturally relevant pedagogy and teaching students exceptionalities. The program was authorized and accredited by the Ohio Board of Regents. The UTeach Institute made site visits in fall and spring semesters to track the implementation and progress of our CSUTeach program, and to get student feedback.

With ODE grant and the National Science Foundation funding, the CSUTeach program has fully employed the UTeach model and has grown (close to doubled) the size expected by the UTeach Institute. We have currently 94 pre-service teachers in the program. Two undergraduate students made a commitment to becoming Noyce Scholars. The Scholars will
complete field experiences in local, high-need schools that have student populations and environments that mirror those of their anticipated first teaching jobs in underserved urban districts or schools. Our CSUTeach students are placed in field experiences within the Cleveland Metropolitan School, Bedford City School, and Elyria City School Districts.

Marketing and recruitment efforts have remained strong. Program flier, LCD campus screen, and web advertising have been used. Faculty, staff, and supporting graduate assistants have actively recruited prospective students, making 5-10 minute presentations in 45 mathematics and science courses, and representing the program at informational tables at various university open houses and orientations. Local district presentations about the CSUTeach program have encouraged math and science teachers to become Mentors for our field experience students. We currently have 93 Mentor teachers ready to help in our five field experience courses.

34
Title: Noyce Teacher Academy at the College of Staten Island (CSI)
NSF Noyce Award Number: 0934533
Principal Investigator: Jane Coffee
Email: coffee@mail.csi.cuny.edu
Institution: College of Staten Island
Co-PI(s): Irina Lyublinskaya and Susan Sullivan
Presenter(s): Irina Lyublinskaya, College of Staten Island, irina.lyublinskaya@csi.cuny.edu
Project Discipline: Mathematics and Science
URL(s): www.csi.cuny.edu/noyce

The first cohort of 3 Noyce Teacher Academy Scholars, Amanda Mistretta, Souad Outraid, Christina Rivera, who are mathematics majors and are scheduled to graduate in May 2012 with New York State initial teaching certification. Each Noyce Teacher Academy Scholar spends 50 hours per semester in a high-need New York City high school that includes New Dorp High School, Port Richmond High School, College of Staten Island High School for International Studies, and Intermediate School 49.

Other activities and accomplishments of the Noyce Teacher Academy at the College of Staten Island include:

- Development of Evaluation Surveys for Noyce Teacher Academy Scholars and their collaborating teachers.
- TI-Nspire Navigator workshop, “Assessing Students Learning in High School Mathematics with TI-Nspire Navigator”, on 12/7/2010 presented by Dr. Irina Lyublinskaya for mathematics pre-service teachers that included the Noyce Teacher Academy Scholars.
- Smart Board workshop on 3/31/2011 presented by Dr. Irina Lyublinskaya for Teacher Education Honors Academy students that included the Noyce Teacher Academy Scholars.
- Recruitment of the second cohort of Noyce Teacher Academy Scholars: To date, there are 6 students (3 math majors and 3 biology majors) who require 2 years to complete their major and the requirements for New York State initial teaching certification and 1 student (math major) who will require 3 years and all are excellent candidates for acceptance in cohort 2 of the Noyce Teacher Academy.
- The Alfred Harcourt Foundation has awarded the Teacher Education Honors Academy scholarship funding for total tuition for 3 students in their sophomore year. This award will create a pipeline for students who will enter the Noyce Teacher Academy in their junior year.
- The Teacher Education Honors Academy (TEHA) has developed a partnership with the Tomas de Berlanga School in Santa Cruz, Galapagos, Ecuador. In 2010, CSI provided funding for two faculty (co-PIs on the NSF Noyce grant) and two TEHA students to spend a month student teaching math and science. This experience was featured in http://csitoday.com/2010. In 2011, the Alfred Harcourt Foundation will provide funding for two TEHA students including one Noyce Scholar to participate in this partnership.
- Activation of Noyce Teacher Academy website: www.csi.cuny.edu/noyce that includes application forms for three different pools of candidates for Noyce Scholarship’s current CSI students, transfer students, and current members of the Teacher Education Honors Academy.

35
Title: The Noyce Intern-to-Teacher Pathway: Lessons Learned
NSF Noyce Award Number: 0934793
Principal Investigator: Danuta Bukatko
Email: dbukatko@holycross.edu
Institution: College of the Holy Cross
Co-PI(s): Beverley Bell, Daniel Bitran, Catherine Roberts, and Janine Shertzer
Many Noyce projects incorporate a STEM teaching internship which offers first- and second-year undergraduates with opportunities to tutor children in high-needs school districts. For most projects, the goal is to provide STEM majors with the chance to experience the rewards of teaching, increasing the likelihood that they will consider careers in teaching. This poster will describe “lessons learned” from two years of conducting a Noyce intern program on our campus. Information gathered from questionnaires and focus groups suggests strategies that can strengthen the tutoring experience and make it more likely that Noyce interns continue on the pathway to becoming Noyce Scholars, and eventually, teachers.

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**Title:** Noyce Scholars Program at the College of William and Mary: Progress and Lessons Learned in the First Two Years  
**NSF Noyce Award Number:** 0833330  
**Principal Investigator:** Paul D. Heideman  
**Email:** pdheid@wm.edu  
**Institution:** College of William and Mary  
**Co-PI(s):** Heather Macdonald, Juanita Jo Matkins, Marguerite Mason, and Virginia McLaughlin  
**Presenter(s):** Paul D. Heideman, College of William and Mary, pdheid@wm.edu  
**Project Discipline:** Biology, Chemistry, Earth Sciences, Physics and Mathematics  
**URL(s):** http://www.wm.edu/as/sciencemathed/noyce/index.php  
http://education.wm.edu/admissions/financialaid/stem/noyce/index.php

The College of William and Mary (W&M) has completed two years of a Phase I Noyce Scholars Program to produce 39 new science and mathematics teachers. Awards have been made to 20 Scholars (Years 1 & 2), and 10 new Scholars are entering for Year 3. Scholars have been in biology (30%), mathematics (30%), earth sciences (20%), chemistry (10%), and physics (10%), with three-fourths at the graduate level and one-fourth at the undergraduate level. Our Noyce Program includes (a) two special one-credit academic courses for Noyce Scholars (“How Students Learn” and a Practicum focused on high-need settings), (b) science and mathematics summer internship opportunities for research, curriculum, and professional development for Noyce scholars; and (c) follow-up mentoring and support for graduates. Recruitment of students into STEM teaching at our institution has nearly tripled during our Noyce project thus far, and visibility of STEM teaching careers has increased dramatically.

Important contributors for success of our program have been strong support from faculty in the sciences and mathematics for recruitment of academically-strong students, a designated recruiter and collaboration with the Career Center on campus, a new fifth-year program for science and mathematics majors in our School of Education, and a strong management team with good interactions between faculty in the School of Education and science and mathematics departments. Especially important problems to address in our project have been (a) methods to select Scholars who have strong potential to be successful as teachers in high-need settings, (b) provision of useful experiences in high-need schools, and (c) retention of Scholars in teaching, with attrition being a concern. Current procedures in our program, will be presented and changes to address problems that arose will be discussed.

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**Title:** Colorado State University Noyce Phase I Project  
**NSF Noyce Award Number:** 1035298  
**Principal Investigator:** Donna Cooner  
**Email:** dcooner@cahs.colostate.edu  
**Institution:** Colorado State University  
**Co-PI(s):** Jan Nerger, Thomas Siller, Paul Kennedy, and Cerissa Stevenson  
**Presenter(s):** Donna Cooner, Colorado State University, Donna.Cooner@colostate.edu  
**Project Discipline:** Science Technology Engineering and Math  
**URL(s):** http://www.cns-eoc.colostate.edu/noyce.html

Colorado State University (CSU) has recently been awarded funding for a Noyce Phase I project. CSU currently prepares one of the largest numbers of STEM teachers in the state of Colorado and has a unique statewide partnership with high-need schools (CSU Alliance School Program) that provides an immediate connection to place successful graduates where they are needed most. One of the distinctive aspects of the multi-disciplinary efforts at CSU is that it is the only institution in Colorado able to prepare teachers in all four areas of STEM, including engineering teacher licensure.

Through this project we will identify and provide scholarships to high-performing CSU undergraduates in the STEM
Poster Abstracts

Disciplines who commit to teach in high-need schools. Our first cohort of scholars has recently been identified. They were officially recognized at a Teacher Licensure ceremony in May and they will receive their first scholarships for the 2011-2012 academic year. Scholars are from the science, math and engineering disciplines. This poster will highlight our Noyce scholars, our recruitment efforts, and describe the unique summer engineering program designed to recruit future scholars. The evaluation plan from our partner, Biological Sciences Curriculum Study (BSCS) Center for Research and Evaluation, will also be presented.

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Title: Dowling College Robert Noyce Scholarship Program Phase II
NSF Noyce Award Number: 0335799
Principal Investigator: Lori Zaikowski
Email: zaikowsl@dowling.edu
Institution: Dowling College
Co-PI(s): Kevin McDonnell and Daniel Ness
Presenter(s): Daniel Ness, Dowling College, nessd@dowling.edu
Brad Kenedy, Dowling College, bradleykenedy@yahoo.com
Project Discipline: Mathematics, Education, Earth and Marine Sciences
URL(s): http://www.dowling.edu/noyce/

A shortage of science and mathematics teachers exists statewide in New York, and retention of teachers in high-need schools is low. To address this need, the NSF Robert Noyce Scholarship Phase II Program at Dowling College provides funding for six juniors and seniors and 12 career-changers to obtain mathematics and/or science teacher certifications and additional professional development. Every Noyce scholar is paired with both a Principal Investigator as faculty mentor, who directs academic and personal interventions and advises students in selecting professional development, and a Phase I scholar who also provides mentoring and career-planning advice. Postgraduate activities include an annual four-session Noyce Seminar course, seminars, and workshops. Continuing professional development is at the heart of the program, and a fund provides money for all scholars to engage in a variety of valuable experiences. The high standards for Noyce scholars in content and pedagogy as well as continued professional development and support enables them to have a major impact on the quality of K-12 science and mathematics instruction.

The importance of integrating research and education is addressed by providing opportunities for scholars to gain research experience and serve as mentors to high school students conducting research. New initiatives in the Phase II project include the Noyce Summer Professional Development Workshops, the Noyce Summer Research Institute, and the Noyce Science and Math Academy for high school students. Each year the PIs and scholars organize a Noyce High School Science and Math Symposium. Students present their research at a poster contest and attend math and science workshops led by experts in their fields. The 2011 Symposium was held on March 28 and was attended by approximately 300 high school students, teachers, and judges. Feedback provided by the teachers and students has been very positive.

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Title: Drexel University Noyce Scholarship Program: Phase II
NSF Noyce Award Number: 0934809
Principal Investigator: Sheila R. Vaidya
Email: vaidyasr@drexel.edu
Institution: Drexel University
Co-PI(s): Donald McEachron and Patricia Henry Russell
Presenter(s): Sheila R. Vaidya, Drexel University, Vaidyasr@drexel.edu
Project Discipline: Mathematics and Science Teacher Education
URL(s): drexelnoycescholars.ning.com

The major goals of the Noyce Phase II project are to recruit career changers with strong credentials in mathematics or science, and educate them to become outstanding teachers in high-need schools. Thus far, we have recruited fourteen teachers into the program. Four are teaching in Philadelphia schools (two in Mathematics, one in Chemistry and one in Environmental Science). Phase I teachers are mentors, and a support system to Phase II teachers, with whom they meet online, at campus held Noyce seminars, and are also connected through Facebook. An interactive website is developed to share information and develop a Noyce teaching community. Monthly Noyce seminars are provided to motivate and support learning experiences and to address issues of concern as they emerge, such as how to obtain National Board certification and how to become ambitious teachers. On-site teacher monitoring is an important aspect of our program.

40
Title: East Central University (ECU) Robert Noyce Teacher Scholarship Program (Phase-I)
NSF Noyce Award Number: 0934030
Principal Investigator: Robert Ferdinand
Email: rferdand@ecok.edu
Institution: East Central University
Co-PI(s): Heather Hannah, John Bedford, Janet Wansick, and Linda Braddy (former Co-PI)
Presenter(s): Robert Ferdinand, East Central University, rferdand@ecok.edu
Project Discipline: Mathematics
URL(s): cs.ecok.edu/~rferd/noyce/home.pdf

This poster highlights the East Central University (ECU) Robert Noyce Teacher Scholarship Program (Phase-I) and includes the following: (a) general features, (b) collaborating schools, (c) annual scholarship amount, (d) teaching commitment, (e) recruitment, (f) competitive selection, (g) brochure, (h) pre-service support structures, (i) in-service support structures, (j) other attributes, and (k) acknowledgments.

The first cohort of eight Noyce scholars started the program in the Fall 2010 semester. Applications for the second cohort, which will start the program in Fall 2011, are currently being reviewed. Two high-need math school teachers and one university math professor have presented at ECU Noyce Colloquia. The scholarships have helped the Noyce scholars tremendously in focusing on getting their math teacher certification degrees and not having to worry about 'making ends meet.'

41
Title: Eastern Washington University Robert F. Noyce Scholarship Program
NSF Noyce Award Number: 1035510
Principal Investigator: Keith Adolphson
Email: kadolphson@ewu.edu
Institution: Eastern Washington University
Co-PI(s): Heather McKeel, Kevin Pyatt, Barbara Alvin, and Margaret O'Connell
Presenter(s): Keith Adolphson, Eastern Washington University, kadolphson@ewu.edu
Project Discipline: Mathematics, Science (Biology)
URL(s): http://www.ewu.edu/cshe/noyce.xml
http://www.ewu.edu/CSHE/noyce/internship.xml

The goal of the Eastern Washington University (EWU) Robert Noyce Scholarship program is to increase the number and quality of science and mathematics teachers by encouraging majors in Science, Technology, Engineering, and Mathematics (STEM) disciplines to become teachers. The program is a partnership between EWU and Spokane Public Schools. Scholarships of up to $16,000 per year are available for up to twelve pre-service teachers each year. Recipients must commit to serving two years as a mathematics or science teacher in a high-need education agency for each year of support received.

Scholarship recipients will be placed in inquiry-based classrooms in high-need schools, working with highly qualified math and science teachers. Scholarship recipients will work directly with EWU faculty and K-12 mentor teachers to deliver highly effective inquiry-based teaching emphasizing student engagement.

Some of the important elements of the project include:
- Rigorous scholar selection process;
- Placement with select, highly-qualified mentor teachers for extensive field experience in inquiry methods and student engagement strategies;
- Placing scholarship recipients in high-need schools to better prepare them for their future teaching experiences;
- Developing scholarship recipients into a collaborative professional learning community with their mentors and project staff, so they can continue to support each other while teaching; and
- Building on relationships with the Kalispel Tribe and other local service agencies serving low-income youth to provide summer internships for freshman and sophomore STEM students to 'try teaching' and help recruit potential future scholars. Additional 'try teaching' experiences in Biology are offered on campus during the academic year.

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Title: ECSU’s First Year Noyce Scholars Program: The IPOD Touch Pilot Program
NSF Noyce Award Number: 1035454
Principal Investigator: Farrah Chandler
Email: fjchandler@mail.ecsu.edu
Institution: Elizabeth City State University
Co-PI(s): Adetayo Adedeji
Presenter(s): Farrah Chandler, Elizabeth City State University, fjchandler@mail.ecsu.edu
Project Discipline: Mathematics and Science
URL(s): www.ecsu.edu/mcs

Many activities have occurred during the planning year of the Elizabeth City State University’s Noyce Scholars program. A Noyce Scholars website has been developed, and brochures have been distributed in science and mathematics classes. The Noyce Scholars program has also been advertised at science and mathematics major’s meetings, career fairs,
homecoming, student government association events and faculty institutes. During the 2011 School of Mathematics, Science and Technology’s Research Week, a mathematics education scholar was brought to campus and presented on “Discovering the Impact of Teaching.” In June, freshman and sophomore mathematics and science majors participated in a three week summer internship program for middle school students. The summer program was designed to provide meaningful experiences for STEM undergraduates, hopefully sparking their interest in STEM education, thereby increasing the pool of Noyce Scholars.

The first cohort of five Noyce Scholars has been recruited. The cohort consists of all African-Americans, one senior, two juniors and two post baccalaureates; four of the scholars will become secondary mathematics teachers and one has a major in chemistry and will be licensed in secondary science. Beginning in September, the Noyce Scholars will participate in the weekly Preparation of Highly-qualified Advanced STEM Educators (PHASE) Program which will include sessions on effective uses of technology in teaching, developing and teaching hands-on and inquiry based-lessons, and research in STEM education.

During the Spring 2011 semester, a pilot study was conducted using the iPod Touch with pre-service teachers. These teachers used the iPod Touch during their student teaching experience to videotape their teaching demonstrations and reflect upon their teaching. After the student teacher university supervisor conducted in-class observations, the iPod touch was used to videotape the supervisor teaching portions of the student’s lessons that needed improvement. The videos were then uploaded to YouTube, and the student teachers were responsible for viewing the video the same day. After viewing the video the university supervisor and the student teacher used the iPod touch Skype and/or Facetime feature to discuss the observation and video demonstration virtually. Lastly, the university supervisor and pre-service teachers also used the iPod touch Skype and/or Facetime feature to communicate “face to face” weekly. Preliminary data was collected on participant’s sense of Mathematics Teaching Efficacy and perceptions of the use of technology to teach mathematics. The iPod touch pilot study provided valuable information which will be incorporated into the Noyce Scholar’s Program.

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Title: Florida State University Robert Noyce Scholarship Program
NSF Noyce Award Number: 0934702
Principal Investigator: Joseph A. Travis
Email: travis@neuro.fsu.edu
Institution: Florida State University
Co-PI(s): D. Ellen M. Granger, Sherry A. Southerland, Kathleen Clark, and Victor D. Sampson
Presenter(s): Karen Rose, Florida State University, kr04@fsu.edu
Alexsandra Kyle, Florida State University, amk08e@fsu.edu
Project Discipline: Science and Mathematics
URL(s): http://fsu-teach.fsu.edu/noyce/

One of the major hurdles in the Noyce program at Florida State University (FSU) has been attracting applicants. Mass communication advertising and personal invitations to participate were insufficient in attracting adequate numbers. In addition, we simultaneously contacted parents of potential applicants with a letter about the program and the service component expectations. This year, we focused on a number
of different recruitment strategies to increase the number of applicants. The approaches employed include: advertising posters, general emails, letters to parents of potential applicants (and timing of those letters), personalized contact with suitable candidates (face to face and email), announcements in education courses by Noyce Scholars, and announcements on a bulletin board dedicated to the activities of the Robert Noyce Scholars. The poster will include graphical data, pictures and information about the activities of the FSU Robert Noyce Scholars.

The Fordham University/Wildlife Conservation Society Robert Noyce Teacher Scholarship Program is designed to incentivize (through scholarship and other supporting funds) talented STEM majors and professionals to become science teachers in high-needs public schools. The Fordham University/Wildlife Conservation Society (WCS) partnership taps the resources of the WCS, one of the world’s largest providers of teacher training focused on wildlife conservation and environmental science, and Fordham’s Graduate School of Education’s deep store of research and teaching expertise. This partnership is the first program of its kind and may emerge as a national model for pairing universities and informal science institutions through the activities directly connected to a funded NSF Robert Noyce Scholarship program.

Title: Fordham University/Wildlife Conservation Society Robert Noyce Teacher Scholarship Program

NSF Noyce Award Number: 1035391
Principal Investigator: John Craven
Email: jcraven@fordham.edu
Institution: Fordham University
Co-PI(s): Deborah Luckett, Grace Vernon, and Don Lisowy
Presenter(s): John Craven, Fordham University, Graduate School of Education, jcraven@fordham.edu
Project Discipline: Science
URL(s): http://www.wcs.org/teachers/teacherpd/wcs-fordham-university-graduate-program/noyce-scholarship.aspx
http://www.fordham.edu/academics/colleges__graduate_s/graduate__

Work on our project has taken our scholars in several directions. In this presentation, we will describe three experiences that have proven to be beneficial to our program: classroom management, classroom observations, and performance assessments. (1) First, in our ongoing effort to educate and retain our scholars, we have developed a project that emphasizes “classroom management.” We acknowledge that the success of our scholars to improve education depends on their thorough knowledge of the content they intend to teach. However, we also recognize the importance of our scholars developing an effective classroom management system so that their future students will benefit from top notch instruction delivered in both an organized and coherent fashion. To this end, our scholars have participated in surveys and prompted journal writing assignments designed to get them to focus on classroom management issues. They have also responded to videos with examples of both good and bad classroom management practices, and participated in small group discussions from educational literature on the topic.

This presentation will document the progress made by our scholars in understanding classroom management. (2) Second, our project has also benefitted from the College of Education’s Pre-Professional Block (PPB) of courses. All of our scholars have had to complete the PPB field observations practicum in order to be eligible for our scholarship program. Even though the classroom observations filtered out some students who had considered teaching as a profession, we have still met our predicted goal so far for the total number of scholarships granted. In this presentation, data will be provided that documents and more fully explains the effect parts of the country by serving as a model to other IHEs and cultural institutions through the activities directly connected to a funded NSF Robert Noyce Scholarship program.

Title: A Trio of Experiences: SMART Scholars at Georgia Southern University

NSF Noyce Award Number: 0833265
Principal Investigator: Jim LoBue
Email: JLoBue@GeorgiaSouthern.edu
Institution: Georgia Southern University
Co-PI(s): Michelle Cawthorn, Joy Darley, Marlynn Griffin, Brian Koehler
Presenter(s): Joy W. Darley, Georgia Southern University, jdarley@georgiasouthern.edu
Project Discipline: Mathematics and Science Education
URL(s): SMART Scholarship: http://cost.georgiasouthern.edu/smartscholarship/index.htm
POSTER ABSTRACTS

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Title: An Examination of a Teacher Internship Program on STEM Majors’ Science Teacher Identity Development

Most students who pursue a bachelor’s degree in a STEM field do not think about K-12 STEM teaching as a serious career choice. Studies have also shown that quite often the decision to become a STEM teacher (science teacher in our study) is taken after obtaining the STEM degree, and as a last resort career path. This results in various detrimental effects on the quality of science teaching in the schools. Reasons for this may vary. For example, teachers may not be psychologically motivated to teach since teaching was not their first career choice, teachers’ content expertise may not be well developed, and also many teachers quit the profession within the first five years. As an effort to begin to address this and to examine how we can increase the pool of highly qualified and motivated science teachers, we offered paid summer teaching internship opportunities to a group of STEM majors at a nationally highly ranked university located in the southeastern United States. The interns, supervised by mentors, were placed in a school-based summer science program where they conducted interactive theme based PBL lessons in authentic settings. The study focused on understanding the perceptions of science teaching and the teaching profession by the interns and on examining the impact of their internship experience on their decision to pursue careers in secondary science education. Data was collected from weekly blog posts, and case studies written by the participants at the end of the internship. This study is part of a larger, ongoing investigation of I-MAST Robert Noyce Teacher Scholarship Program at our institution.

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Title: Robert Noyce: Urban Mathematics Educator Program

The Robert Noyce: Urban Mathematics Educator Program (UMEP) at Georgia State University is currently in year seven of the project. The goal of the UMEP is to increase the number of high-quality secondary mathematics teachers who seek jobs in urban school districts and are committed to remaining in urban school environments. The project was designed: (1) to recruit individuals who demonstrated a willingness and commitment to teach secondary mathematics in urban high need schools, (2) to graduate 40 UMEP Scholars (10 per year) who would commit to teaching in our partner school districts, the Atlanta Public Schools and the DeKalb County Schools System, (3) to support our Scholars in the induction years, and (4) to provide seminars and other forms of professional development to support the retention of our Scholars in high need schools beyond the induction years.

Over the duration of the project, the leadership team has worked closely with the Scholars in monitoring their progress in the degree program, offering seminars to support further development for working in high need schools, and providing ongoing professional development to support them as teachers. All of the initiatives have focused on the development and retention of high-quality teachers. Thirty-five scholars completed the degree program; 33 of these scholars are currently teaching in high needs schools giving the project an overall 82.5% success rate. In August 2010, the last cohort of teachers entered into teaching in high needs schools. The overall retention rate for the UMEP is 94% for those entering into teaching in high need schools upon
completion of the degree program. Scholars from the 2005 to 2008 cohorts have been teaching in high need schools beyond the required years to complete their obligations as Noyce Scholars. This represents a 94% retention rate of Noyce Scholars in high need schools beyond three years of teaching.

The UMEP operates as an active Professional Learning Community (PLC) composed of the scholars, the UMEP leadership team, secondary mathematics teachers including mentor teachers, and school administrators. This component has been in place since the inception of the program. However, the format for PLC engagement has evolved over time to accommodate the Scholars in their various environments, especially as they have become more geographically spread by the location of their schools. For continued support of the scholars, we moved to include an online learning environment for PLC meetings and other social networks for professional development and ongoing support systems. We have maintained communication with all 33 Scholars and continue to support and encourage their participation in the UMEP PLC.

49
Title: Hampton University Robert Noyce Teacher Scholarship Program
NSF Noyce Award Number: 0934715
Principal Investigator: Carolyn Morgan
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Institution: Hampton University
Co-PI(s): Clair Berube
Presenter(s): Carolyn Morgan and Clair Berube
Project Discipline: Biology and Mathematics
URL(s): http://science.hamptonu.edu/math/noyce/

The Hampton University (HU) Robert Noyce Teacher Scholarship program is designed to encourage and prepare talented science, technology, engineering, and mathematics (STEM) majors and professionals to become mathematics and biology teachers, especially members from underrepresented groups. The HU Noyce Teacher program provides scholarships, stipends, and academic programs for undergraduate STEM majors and post-baccalaureate students holding STEM degrees who commit to teaching in the high-need school districts. As an undergraduate biology or mathematics major and a Noyce Teacher Scholarship recipient, a student can receive scholarship funding for up to a maximum of three years, including a $2,700 stipend for participating in an internship program in the summer between the sophomore and junior year; and $10,000 scholarship annually during the junior year, senior year, and one year of graduate study.

Eligible applicants must be full-time HU students who are pursuing a major in mathematics or biology and are finishing their sophomore year. The student must be a U.S. citizens or nationals, or permanent resident alien, have a strong record of academic progress and meet the admission requirements for the HU College of Education teacher education program. The HU Noyce Teacher Scholarship recipients are expected to commit to and maintain a good standing in the program, maintain a minimum GPA of 2.5, be able to start teacher certification program courses upon receipt of the award, meet the requirements for Virginia teacher license by the end of the program, and commit to teach two years in a high-need school district for each year the student receives scholarship funding (otherwise the funds must be repaid).

We currently have three Noyce scholars who have participated in summer internships programs at the NASA Langley Research Center, Hampton City School District and a summer camp program for elementary school children. One of our scholars will graduate in May 2012, with a Masters of Arts in Teaching Biology and one with a Masters of Arts in Teaching Mathematics.

50
Title: Putting the Pieces Together: Identifying Existing Resources at Hunter College to Attract and Retain Noyce Scholars
NSF Noyce Award Number: 0833134
Principal Investigator: Jeanne Weiler
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Co-PI(s): Pamela Mills and William Sweeney
Presenter(s): Jeanne Weiler, Hunter College, jweiler@hunter.cuny.edu
Project Discipline: Biology, Chemistry, Earth Science, Mathematics, Physics
URL(s): http://hunternoycescholars.org

The Hunter College Noyce Scholars Program has accepted 15 high-performing Scholars into mathematics (11), biology (3), and chemistry (1) BA/MA programs that lead to professional teacher certification in grades 7-12. Recruitment through the summer and fall 2011 is expected to increase the number of Noyce Scholars to 25.

In addition to receiving up to $5,000 a semester in scholarship support each semester for two years, Noyce Scholars have the opportunity to engage in STEM-education
related research and experiences guided by STEM-education faculty. These include: a robotics class where mathematics majors design math lessons using the building and operating of robots, a biology experience that analyzes small animal burrows using probe cameras, small group teaching experiences at all levels in mathematics in the Dolciani math resource center, working with math or biology professors who assess outcomes in introductory courses using statistical software, and assisting STEM high school teachers in urban classrooms. In order to provide opportunities for Noyce Scholars to socialize and gain experiences outside of an urban environment, an overnight trip to Black Rock Forest, a 4,000 acre forest located an hour outside of New York city is planned. Staff will introduce Noyce Scholars to using the outdoor habitat to develop mathematics and science lesson plans.

In Spring 2011, a trip is planned aboard Pete Seeger’s sloop that navigates the Hudson River and engages students in learning about the river’s ecosystem. For both trips, students from the Hunter Geography Club and Noyce Scholars from York College, CUNY will be invited.

Currently, project staff are creating a new teacher induction program, identifying master teachers and, collaborating with the teacher placement office at the college. An articulation agreement in secondary education mathematics has been implemented with Borough of Manhattan Community College (BMCC), and plans are underway to introduce the Noyce program to BMCC math and science faculty and academic advisors.

To date, recruitment has consisted of large banners set at strategic locations in the college, an advertisement that continually runs on the college’s flat screen monitors, tabling and handing out information, leafletting in front of key math and science courses, mass emails sent to undecided mathematics and science majors, and approaching faculty to identify students. The Noyce Scholars program has a Facebook page and a nascent website. Finally, our Noyce Scholar students have been included in SciMon (funded by the NSF I-cubed award) that joins all mathematics and science professional development and research opportunities for Hunter College students under one umbrella to promote collaboration and broaden student participation in science programs.

51
Title: Illinois State - Noyce Urban Education in a Rural Setting
NSF Noyce Award Number: 0833322

Principal Investigator: William Hunter
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Co-PI(s): Robert Lee, Nerida Ellerton, Elisa Palmer
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Project Discipline: Mathematics and Science
URL(s): http://www.teachereducation.ilstu.edu/ noycescholarship/

Illinois State University (ISU) is a well-respected, premier teacher preparation institution. Chicago Public Schools (CPS) and the Little Village area have high-needs student populations. Through existing collaborative projects between ISU and CPS, the groundwork has been laid for a breakthrough in student academic achievement and career aspirations. With the help of the Robert Noyce Teacher Scholarship Program we can achieve that breakthrough and impact the lives of 25,000 students as a result of this project. Funding the ISU Robert Noyce Program will facilitate the achievement of Noyce goals and will assist in recruiting new highly qualified STEM teachers into our nation’s neediest classrooms, thus improving the quality of teaching and learning of mathematics and science where it is needed most.

The ISU Robert Noyce Teacher Scholarship Program activities will be a significant expansion of efforts recruiting nontraditional candidates from the CPS Little Village Area to teacher preparation programs in mathematics and science. At ISU we have many years of experience in training science and math teachers who are recruited to teach all across the United States. In the past five years, we have moved purposefully into the CPS. Last year, CPS hired nearly 100 ISU graduates, mostly in elementary education. We have begun a research program in which we are conducting a factor analysis of the pre-service experiences that lead to particular urban career patterns of retention, quality, student achievement, etc. (Lee & Radner, 2006). This research is relevant for the ISU Robert Noyce Teacher Scholarship Program, and promises to provide specific evidence of the types of experiences which can lead to teacher retention and student success in mathematics and science. Further, when comparisons are made with the greater ISU teacher education candidate population, the research may lead to programmatic changes and insights in urban mathematics and science teacher preparation.

The ISU Noyce Program will support a total of 52 new STEM teacher candidates. Applying ISU’s 80% retention of those teachers for 5 years beyond their teaching commitment, we will have influenced nearly 25,000 students in the heart of a high needs school district. By any measure, an impact of this
scale would be impressive. More broadly, we will also conduct studies and develop models of the concerns and methods of preparation for STEM professionals who switch into STEM teaching. As we disseminate these studies and models, we will broadly inform other colleges and universities specializing in teacher preparation, high-needs LEAs seeking to meet projected and current staffing shortages for STEM teachers, and candidates and potential candidates themselves about our strategies, successes and challenges.

To date we have made award offers to 32 students in the three years of our program. Our planned program for fall 2011 includes: Award Dinner, College of Education Chicago Urban Bus trip, having students join UNITE events, Hosting Chicago TEACH clubs at ISU, Noyce Program Chicago School Trip, Spring Noyce Scholarship Recruiting Meeting, Noyce Awardee-Driven Event, ISU High School & College Research Symposium, and the Truman College Pre-service Teacher Days.

52
Title: Midwest Noyce Regional Conference in 2011
NSF Noyce Award Number: 1002638
Principal Investigator: Kim S. Nguyen
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Co-PI(s): Kathleen A. Marrs, Indiana Univ. Purdue Univ. Indianapolis
Signe Kastberg and John Staver, Purdue University
Presenter(s): Kim S. Nguyen, IUPUI, knguyen@iupui.edu
Project Discipline: STEM Education
URL(s): http://www.noyceconferenceindy.org/

Midwest Noyce Regional Conference provides a network of peer support to Noyce Teacher Scholarship project personnel and Noyce Scholars to improve the program effectiveness throughout 17 states in the region. The conference at IUPUI in 2011 gathered 150 Noyce Investigators, current Noyce Scholars, practicing Noyce Scholar Teachers and school district personnel, as well as project evaluation and assessment experts from more than 50 active Noyce projects in the Midwest: Arkansas, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Wisconsin and West Virginia.

The 2011 Midwest Noyce Conference placed a special focus on professional development aspects of STEM instruction and teaching effectiveness in urban and rural high-need classrooms. It also offered Noyce project personnel the opportunities for sharing best practices in project management and pathways to effectively attract, prepare and develop excellent STEM teacher scholars in the Midwest. The broader impacts of the conference will be seen in the improvement of Noyce program effectiveness and sustaining peer networks of support within the Scholars and among project personnel in the Midwest. Supporting Noyce Scholars’ professional growth during their induction years of STEM teaching in high-need classrooms at urban and rural schools would be an important factor in their overall career satisfaction and thus enhance their desire to stay in STEM teaching profession.

53
Title: Urban Educators: Robert Noyce Scholarship for Mathematics and Science Teachers - Phase II
NSF Noyce Award Number: 0934555
Principal Investigator: Kim S. Nguyen
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Institution: Indiana Univ. Purdue Univ. Indianapolis
Co-PI(s): Signe E. Kastberg, Kathleen A. Marrs, and Jeffrey X. Watt
Presenter(s): Kim S. Nguyen, Indiana University-Purdue University Indianapolis, knguyen@iupui.edu
Project Discipline: Math and Science Education
URL(s): http://www.iupui.edu/ucase/scholarships/t2t/

Noyce II Scholars at IUPUI are enrolled in the Transition to Teaching (T2T) program for STEM professionals to complete the requirements and field experiences for teacher licensures in the sciences and mathematics at secondary level (grades 6-12) over the course of one calendar year. The T2T program builds on the established partnership between the School of Education and high-need school districts in Marion County, including Indianapolis Public Schools system. The current Robert Noyce Program (DUE-0531598) has successfully prepared 26 highly-qualified science and math teachers for the urban high-need classrooms in Indiana.

Noyce Phase II has three objectives: (1) continue to increase the number of secondary science and mathematics teachers - 10 teachers each year, with an emphasis on the recruitment of individuals from ethnic minorities, (2) enhance retention of novice teachers by providing ongoing mentoring for the new teachers, and (3) implement a longitudinal research plan to assess the effectiveness of the Noyce Teacher Scholarship program at IUPUI.

The project has its focus on recruitment of diverse scholars, who possess developed skills in inquiry-based teaching and commitment to serving in urban high-need schools. Noyce
Phase II aims to enhance teacher retention through instructional coaching provided to in-service Noyce teachers. This new feature of the program offers an additional mechanism for assessing the effectiveness of the Noyce scholars’ teaching in high-need school districts. The broader impact of this project would be recognized by enhanced diversity of math and science teachers who commit to increasing the quantity, quality, and diversity of students in urban schools who will enter STEM fields in next decades.

**54**

Title: Indiana Noyce Science Scholars: Teachers for a New Decade  
NSF Noyce Award Number: 1035234  
Principal Investigator: Robert D. Sherwood  
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Institution: Indiana University, Bloomington  
Co-PI(s): Catherine A. Pilachowski  
Presenter(s): Robert D. Sherwood, Indiana University, Bloomington, rdsherwo@indiana.edu  
Project Discipline: Life and Physical Sciences  
URL(s): http://education.indiana.edu/Science/tabid/14859/Default.aspx

“Indiana Noyce Science Scholars: Teachers for a New Decade” is a phase I Noyce Scholarship project in its first year of operation. Faculty in the College of Arts and Sciences, and the School of Education at Indiana University-Bloomington, in partnership with selected high needs schools, are working to increase the number of students that select to become science teachers. The project makes use of existing and new innovative programs and partnerships to grow the number of teachers who are prepared to meet the challenges of teaching, especially in high-need 21st century environments.

The program targets two groups of participants, the first are upper division undergraduates who are pursuing life and physical science degrees at Indiana University Bloomington and have decided to teach. These students become part of a new jointly developed program that allows the student to obtain their B.S. degree in a science area and an M.S. degree in Secondary Education in a coordinated five-year program. The second set of participants are recent or more mature graduates of STEM programs who have decided to teach. Both sets of students pursue their licensure through the Transition to Teaching or Community of Teachers post-baccalaureate programs. Both of these programs make extensive use of clinical experiences in schools and are designed to allow participants the opportunity to work with high-needs students.

Participant recruitment methods included an extensive web presence with an on-line application (http://education.indiana.edu/Science/tabid/14859/Default.aspx), flyer distribution to undergraduate advising offices, mailings to four-year colleges and universities in Indiana, and direct mailings to students expressing interest in science education in their GRE test information.

Eight participants have been selected to receive Noyce funding during 2011 and into 2012. All are post-baccalaureate students with seven in the Transition to Teaching program and one in the Community of Teachers program. They come from several different states; have science backgrounds in Biology, Chemistry, Physics and Earth/Space, and represent different genders and ethnicities.

**55**

Title: K-State TEACH: The Noyce Scholarship Program at Kansas State University  
NSF Noyce Award Number: 0934905  
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Institution: Kansas State University  
Co-PI(s): Sanjay Rebello and Carolyn Ferguson  
Presenter(s): Christopher T. Culbertson, Kansas State University, culbert@ksu.edu  
Project Discipline: Biology, Chemistry, Physics, and Geology

The K-State Robert Noyce Scholarship Program is a Phase I program designed to increase the supply of highly qualified middle and high school teachers (Grades 6-12) in biology, chemistry, earth and space science, and physics. The program is managed by a leadership team with members from Education, Chemistry, Biology, Physics and Geology.

The program seeks to: (1) provide opportunities for 25 freshmen and sophomores to work in informal STEM education settings both on and off campus; (2) increase by 17 the number of undergraduates in the targeted STEM disciplines receiving licensure; and (3) enable 12 graduates in the targeted STEM disciplines to gain licensure through a newly established Graduate Certificate in Teaching and Learning.

High needs schools high needs schools have been identified and recruited through three existing partnerships: the Professional Development School Partnership, the Center for Intercultural and Multilingual Advocacy, and the Center for Rural Education and Small Schools. These targets schools serve a high percentage of individuals from families with
incomes below the poverty line, a high percentage of English language learners (ELLs), and/or rural populations.

The evaluation plan includes the development of a database for maintaining demographic data; the Scholar’s academic progress and perceptions of the usefulness of the program elements; the effectiveness of program elements, especially new teacher support; and subsequent teaching challenges in high need schools.

56
Title: Teacher Recruitment Initiative in Physics and Chemistry: A Collaboration Between Kennesaw State University and Georgia Institute of Technology
NSF Noyce Award Number: 0733830
Principal Investigator: Taha Mzoughi
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Institution: Kennesaw State University
Co-PI(s): Gregory Rushton, Donna Whiting, Adrian Epps, and Michael Dias
Presenter(s): Taha Mzoughi, Kennesaw State University, tmzoughi@kennesaw.edu
Project Discipline: Chemistry and Physics
URL(s): http://physci.kennesaw.edu/noyce/

The Teacher Recruitment Initiative in Physics and Chemistry program is a collaboration between Kennesaw State University (KSU) and Georgia Tech (GT). The program encourages and enables GT and KSU undergraduate science and engineering majors to pursue careers in high school chemistry and physics teaching. As the premier technological university in the southeast United States, GT produces graduates with deep science and mathematics content knowledge, but who historically have had no access to courses in teaching pedagogy and learning theory nor coordinated assistance with either job placements in K-12 teaching or early teaching support. KSU, on the other hand, has the second largest teacher preparation program in Georgia with programs at the undergraduate and graduate level and is the largest producer of graduates in Georgia prepared to teach mathematics at the high school level. Following up on this success in producing secondary mathematics teachers, with help from Noyce funding, the KSU College of Mathematics and Science, in collaboration with the College of Education, has implemented a Masters of Arts in Teaching (MAT) program in chemistry and physics teaching. The Robert Noyce Teacher Recruitment Initiative will provide 2-year scholarships to 32 science and engineering majors from GT and KSU over a four year period. The scholarship is to be awarded during the senior undergraduate year, and during enrollment in KSU’s new 15-month chemistry and physics MAT program. The poster will highlight the results of our three years in the project.

57
Title: Kennesaw State University's Noyce II Recruitment and Retention Program for TFs and MTFs
NSF Noyce Award Number: 1035451
Principal Investigator: Greg Rushton
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Institution: Kennesaw State University
Presenter(s): Greg Rushton, Kennesaw State University, grushton@kennesaw.edu
Project Discipline: Physics and Chemistry
URL(s): www.ganoycescholars.org

This poster will cover our innovative marketing and recruitment plan. We will highlight our advertising campaign which covers both print and online advertising with multiple media outlets, our stakeholder commitments which include STEM companies, educational agencies, schools, employment agencies, and related employment organizations, and our event management strategy. Included on the poster will be charts and graphs showing demographics, recruitment initiatives, and items such as expected future demand for physics and chemistry teachers.

58
Title: Preparing Mathematics Teachers for All Students: An Innovative Approach, Year 2
NSF Noyce Award Number: 0934791
Principal Investigator: Desha Williams
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Project Discipline: Mathematics

There is a need for all teachers to be prepared to educate all students effectively in mathematics, including those who have limited English proficiency (Thomas & Collier, 2001). However, a national study found that a minority of teacher preparation programs actually prepares mainstream teachers.
to teach English learners (ELs) (Menken, Antunez, Dilworth, & Yasin, 2001). Frequently, ELs are placed in mathematics classrooms while still in the early stages of learning English (Abedi, Courtnety, Leon, Kao, & Azzam, 2006). The rationale has been that mathematics is a universal language. However, this rationale is not valid. Mathematics in K-12 classrooms is not focused on only numbers and equations; it also requires significant literacy skills (Short & Fitzsimmons, 2007).

Teachers who are prepared to teach culturally and linguistically diverse students, are equipped with the skills, knowledge, and dispositions to academically challenge ALL students. The Increasing Mathematics Teachers for ALL Students (IMTAS) project is a Kennesaw State University (KSU) and the Georgia Institute of Technology (Georgia Tech) collaboration designed to encourage and enable students with strong mathematical backgrounds to pursue careers in high school mathematics teaching while at the same time focusing on innovative pedagogical techniques that combine best practices with social justice, culturally relevant pedagogy, and language support for non-native speakers of English. At the completion of the IMTAS program, participants will be certified to teach secondary mathematics, and they have an opportunity to earn an endorsement to teach English learners. The grant’s goals are to: 1) recruit and provide financial support for academically strong mathematics students who are committed to establishing grade 6-12 mathematics teaching careers in high needs areas; and 2) provide skills and knowledge to meet the language needs of ELs and engage diverse students on in cognitively demanding mathematics.

The project just completed its second year with 21 students. One scholar graduated in spring 2010 and teaches in a high school mathematics classroom that consists totally of ELs where she focuses on teaching content and language simultaneously. Data has been collected from workshop surveys, interviews, application information, classroom assignments, and an attitudinal survey. Currently the project investigators are examining a) how the program impacts multicultural teacher development, b) the scholars’ cultural dispositions, and c) how the scholars conceptualize culturally relevant mathematical tasks. We hope to disseminate our findings during next year’s conference.


59

Title: Noyce Scholars’ Epistemological and Professional Development in Learning to Become Mathematics and Science Teachers for High Need Urban Middle Schools

NSF Noyce Award Number: 0833317

Principal Investigator: Gaoyin Qian

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Institution: Lehman College-City University of New York

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Project Discipline: Mathematics, Sciences, STEM, Science Education, Mathematics Education

URL(s): http://www.lehman.edu/academics/education/master-noyce/

We present findings related to Lehman College Noyce Scholars’ experiences in working with diverse students in high need urban middle schools. Their growth in epistemological thinking, professional development in knowledge and skills, and deep understanding of teaching diverse students are discussed. We also present via photos and a DVD an array of meaningful activities that Noyce Scholars engaged in, such as field studies in the Bronx Zoo, a workshop on using local resources to teach science and mathematics in the New York Botanical Garden, and an environmental study of the Bronx River.

60

Title: LSU NOYCE TIGERS

TIGERS: Teaching - Investigating - Guiding - Engaging - Researching - Serving

NSF Noyce Award Number: 0934893

Principal Investigator: Patricia Exner

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Institution: Louisiana State University
Louisiana State University (LSU) Colleges of Education and Science, in collaboration with the Gordon A. Cain Center for Scientific, Technological, Engineering and Mathematical Literacy, received a four-year National Science Foundation award to (1) provide Robert Noyce Scholar undergraduate summer research internships, scholarships, and mentor stipends; and (2) design and implement longitudinal evaluation of students in the Noyce Scholarship programs. Currently in its second year of full implementation, the program assists in fulfilling a critical need in Louisiana for highly qualified secondary science and mathematics teachers and builds on the success of the LSU Geaux Teach program.

The following four NOYCE TIGERS components comprise the overall program structure:

1. $10,000 scholarships awarded to exceptional junior and senior undergraduates who are majoring in science, technology, engineering and/or mathematics (STEM), pursuing teacher certification in the Geaux Teach Program, and have made a commitment to teaching in high-needs secondary classrooms for two years. To date, Seven students received partial scholarships of $5,000, and 12 Scholars have received $10,000 scholarships.

2. Summer Undergraduate Research Internships: Sixty-four $5,000 Internships, plus room and board, are awarded to exceptional freshmen and sophomore students majoring in STEM fields to participate in summer research experiences that engage both authentic scientific/mathematics research in a university laboratory and research-based educational theory and practice. Our ten 2010 Cohort I Scholars have successfully completed their summer research programs. They presented their posters with other undergraduate researchers during the Summer Undergraduate Research Forum July 2010. Our 6, 2011 Cohort II Scholars, have been selected and are currently preparing to enter their research programs.

3. Noyce Scholar Mentor Stipends: Scholar Mentors return to LSU to mentor and facilitate learning experiences that bridge research and education for Summer Undergraduate Research Interns. The goal of this portion of the program is to provide an opportunity for these new teachers, many of whom are former Noyce awardees, to help recruit and retain prospective new teachers. This mentoring experience also enhances their own teaching skills and provides support during their induction years as part of a community of learners in teacher education. Cohort I Scholars paired with mentors in a partnership with the LSU College of Engineering NSF Research Experiences for Teachers program. They attended talks by practicing researchers as well as engaged in professional development activities that provided insight into how to take laboratory research principles and practices and implement them in the secondary classrooms. Cohort II Scholars are preparing to follow the same track, with the addition of former Noyce awardees who are practicing teachers.

4. Evaluation: This project is a Phase II: Scholarship and Stipend Proposal aimed to extend the evaluation of the initial Robert Noyce Teacher Scholarship Program through longitudinal assessment of prior award recipients and develop evaluation plans to assess the overall impact of teacher recruitment, preparation, and retention. A robust tracking system has been developed that includes checkpoints to trigger interventions and assist in the retention of our highly motivated, highly qualified Noyce Scholars.

61
Title: Louisiana Tech University STEM Plus: Equipping Engineers and Scientists to be Teachers
NSF Noyce Award Number: 0733825
Principal Investigator: Galen Turner
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Project Discipline: College of Engineering and Sciences, College of Education
URL(s): http://www.latech.edu/coes/stem-plus.shtml
http://www.latech.edu/education/alternative_certification/

This program is a partnership between the College of Engineering & Science and the College of Education. Participants earn a Master of Arts in Teaching (including teacher certification in Louisiana). Four Noyce Scholars have
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earned their MAT degrees and begun their teaching careers. New scholars enrolled in MAT programs this year. As Stan Napper, Dean of the College of Engineering & Science, stated, “There is no greater difference that an individual can make than to teach the knowledge and skills which can provide a foundation for others to turn their dreams into reality.” Other results and accomplishments will be shared with conference participants.

62
Title: STEM Teacher Preparation via Integrated Teaching Co-operative Education Experiences
NSF Noyce Award Number: 0934442
Principal Investigator: M. Barbara Silver-Thorn
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Project Discipline: Biomedical and Mechanical Engineering, Education
URL(s): www.marquette.edu/engineering
www.marquette.edu/education

The Noyce Scholar Program at Marquette University is based on an adaptation of the cooperative education model that has successfully prepared Marquette engineers for 90 years into a similar program of preparation for engineering and science students desiring to become STEM teachers. This cooperative education model is based upon intensive field experiences in education (i.e., teaching co-ops) integrated with classroom instruction to meet the Wisconsin state standards for STEM teacher licensure. These teaching co-ops occur in middle and high school settings and involve extensive educational field experiences that allow students to meet teacher education standards, a unique standards-based approach to teacher education. Curriculum developed during these first two years of support have included seminars, adaptation of traditional educational classes for the Noyce Scholars and potential scholars, teaching co-op experiences, and project based learning summer outreach experiences. The Future STEM Teacher seminar series features monthly STEM speakers who share their teaching and career experiences. Exceptional science and mathematics high school teachers, many of whom pursued alternative professional careers prior to teaching, volunteer to present a seminar session that showcases the connection between their science, engineering, and/or mathematics careers with their current work as teachers in middle and secondary schools.

Student attendees are then encouraged to enroll in their first Education course, Introduction to Schooling in a Diverse Society, required for all students interested in pursuing teaching licensure. The purpose of this course is to invite prospective teachers and other interested students to think critically about the common, yet often unquestioned, construct of schooling in the US. By focusing on the concerns, demands, conditions, and rewards of the teaching profession; the impact of race, ethnicity, culture, socioeconomic class, and identity on schooling opportunities and experiences; and the multiple layers of power and control that influence schools and communities (historically and in current times), students in this course develop more complex understandings and questions about both schooling and themselves (as students, and as potential future teachers and/or informed citizens). This is not a course on pedagogy designed to teach students how to teach, but rather to facilitate critical reflection about the institution of schooling in our increasingly diverse society.

To introduce future teachers to teaching and working with children from diverse backgrounds, this course requires all students to participate in service learning activities. The potential Noyce scholars are placed in educational settings where they have opportunities to work with middle and high school students in math and science programs. Focus groups and writing assignments help pre-service teachers reflect on their service experiences and their role as future teachers. The next curriculum opportunity is the summer Project-Based Learning (PBL) experiences where Noyce Scholars or potential scholars are placed in local university, high school, and community settings to participate in science and math outreach activities that incorporate PBL. Students also may develop new curricular exercises that incorporate these methodologies. The PBL experiences help foster community of students, faculty, and professionals with a shared interest in STEM education as well as preliminary experiences as a STEM teacher.

The next educational course is offered in the summer session. This course, Psychology of Human Development: Children and Adolescents in a Diverse Society, applies psychological principles of child and adolescent development and provides a critical examination of variables (gender, socioeconomic status, race, ethnicity, culture, and language) that have an impact on physical, cognitive, social, emotional, and moral developmental outcomes. This course has been adapted to include opportunities for the Scholars to observe and work directly with middle school students in both school and community settings, and provides a foundation for the subsequent teaching co-ops.
The first Teaching Co-op is a full immersion high school experience. Scholars enroll in nine credits of education course work that is taught at a partner high school. Students are involved in the course work while simultaneously being assigned to math or science classrooms. During this experience, scholars function under the supervision and direction of the classroom’s cooperating teacher and a designated Marquette University mentor. The university mentor instructs the scholars on learning theories, instructional planning and assessment strategies, classroom management techniques, educational exceptionalities, and strategies a teacher may use to improve literacy skills across the curriculum.

The second Teaching Co-op will be designed for Spring 2012. This middle school immersion experience will focus on teaching methods for middle school science and mathematics. The final Teaching Co-op is the student teaching experience.

63
Title: Scaffolding Noyce Scholars As They Navigate Through Their Developing Identity
NSF Noyce Award Number: 0833287
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Co-PI(s): Angie Calabrese Barton
Presenter(s): Amal Ibourk, Michigan State University, ibourkam@msu.edu
Megan Chapin, Michigan State University, chapinm2@msu.edu
Brittany Shain, Michigan State University, shainbri@msu.edu
Project Discipline: Science Education
URL(s): http://msunoycefellows.wiki.educ.msu.edu/

At Michigan State University (MSU), our focus is to create opportunities for the Noyce scholars that would enable them to establish and maintain a community of practice at the group and individual level. Despite the diversity and complexity of our program, we have a commitment and a programmatic stance to prepare teacher candidates in high need settings. These scholars are navigating through their developing identity as teachers at different program levels from juniors to interns. With the purpose of fostering a sense of a community of practice and a space for them to grow, the Noyce Program at MSU has leveraged resources in the form of field-based experiences, trips to schools, workshops, teacher panels, and a wiki as a technological tool and a shared space for learning. The major field experiences that were offered to the Noyce scholars were having the interns cluster in one urban high school for their student teaching experience. This cluster offered them a shared physical space and a successful support system to each other. Drawing upon cognitive apprenticeship, we also had juniors and seniors pair up with the interns and visit an intern’s school and observe their teaching. The interns acted as mentors to the juniors and seniors, who are apprenticing and participating in a community of practice, but at a legitimate peripheral level (Lave & Wenger, 1991). Furthermore, we organized a trip to Detroit schools where seniors visited a high need school and got to interact with the students, intern, and mentor teacher. Lastly, the wiki has been instrumental in accommodating and taking advantage of the diversity of backgrounds and experiences of our scholars who represent different content backgrounds, field placements, and year in program.

64
Title: Michigan Tech Noyce Teacher Scholarship Program
NSF Noyce Award Number: 0934763
Principal Investigator: Brad Baltensperger
Email: brad@mtu.edu
Institution: Michigan Technological University
Co-PI(s): Chris Anderson, Sarah Green, John Jaszczak, and Shari Stockero
Presenter(s): Brad Baltensperger, Michigan Technological University, brad@mtu.edu
Project Discipline: Science, Mathematics, Engineering
URL(s): http://noycescholars.mtu.edu/

About 80% of Michigan Tech students major in STEM fields; a small proportion of those students choose to become certified to teach secondary school science or mathematics. The Michigan Tech Noyce Scholars Program will provide support for up to 36 STEM majors and STEM professionals. In its first two years, the program has eleven Noyce scholars, roughly equally split between undergraduates and post-graduates. The program emphasizes development of a learning community, strong content knowledge, and enhancement of skills essential to teaching in high-needs schools.

Scholars, mostly drawn from rural communities and attending a university in a rural region over 200 miles from any metropolitan area, are generally unfamiliar with the challenges and opportunities of teaching in urban districts. To build student understanding, the program placed scholars in an intensive weeklong field experience in a Saginaw high school, where they worked closely with teachers, discussed learning issues with faculty from Saginaw Valley State
University, and interacted with community members and school administrators.

The program is built around a multi-level partnership between Michigan Tech, the public schools of Saginaw and Grand Rapids, and faculty from Saginaw Valley State University and Grand Valley State University. School districts have agreed to host scholars for the intensive field experiences and for student teaching; the partner universities provide much of the pre-service and in-service mentoring of scholars. Michigan Tech faculty provide pre-service instruction, as well as an online mentoring course for new teachers and their mentors.

65
Title: Robert Noyce Physics and Mathematics Scholarship Program at MTSU
NSF Noyce Award Number: 0934855
Principal Investigator: Robert Carlton
Email: carltonr@mtsu.edu
Institution: Middle Tennessee State University
Co-PI(s): Ron Henderson, Diane Miller, and Mary Enderson
Presenter(s): Leigh Gostowski, Middle Tennessee State University, gostowsk@mtsu.edu
William Russell, Middle Tennessee State University
Project Discipline: Physics, Mathematics

Among the STEM disciplines that have a deficit of qualified high school teachers, the need is greatest in Physics and Mathematics. The MTSU Physics-Mathematics Noyce Scholarship program was developed to address both of these areas in a state where the need for all STEM teachers is acute. Our program will develop a cadre of teachers who are knowledgeable and passionate about their content material at a depth that will enable them to not just instruct, but also inspire high school students toward STEM careers.

At MTSU, we have developed a culture that places a high priority on STEM education. In fact, our president has articulated the goal of graduating the largest number of secondary STEM teachers in our state. The Physics and Astronomy, and Mathematics departments have worked closely to develop a curriculum that will allow students to graduate with endorsements to teach both subjects, or either individually, and that works within the structure of our university’s new UTeach replication program, MTeach.

66
Title: Mills College’s Robert Noyce Teacher Scholars: Sustaining Teachers as Learners
NSF Noyce Award Number: 0833243
Principal Investigator: Ruth Cossey
Email: rcossey@mills.edu
Institution: Mills College
Co-PI(s): Barbara LiSanti
Presenter(s): Elizabeth Baker, Mills College, ebaker@mills.edu
Project Discipline: Mathematics and Science

A key component of our Noyce Teacher Scholars project is the engagement of mathematics and science pre-service and in-service teachers in research projects that sustain teachers as learners. We investigate how the skills and knowledge needed for excellent STEM teaching in an urban area develop over time. We wish to uncover and highlight those experiences that allow Noyce Scholars to develop an inquiry approach to teaching within a collaborative, reflective frame that is grounded in an ethic of care and that maintains an orientation towards social justice. We think that such lenses will directly and positively impact new teachers’ success and longevity as STEM educators in high poverty schools.

Thus, our Noyce Scholars have the potential to advance the scholarship of teaching within the fields of mathematics and science education as well as advance their own development as teachers through honing their skills as teacher-researchers who ask scholarly questions arising from complex curricular and pedagogical problems that require sustained, careful and systematic examination of their practice in an effort to improve it. We will discuss one common research practice in the program: Pre-Service Lesson Study.

Lesson Study is an integral part of the mathematics and science teaching curriculum at Mills College. The affordances and challenges of Lesson Study are immense. We will report on the experiences of novice teachers as they participated in and learned the strengths of lesson study as a teacher 'owned' process of inquiry.

67
Title: Noyce STEM Teachers Scholars Program
NSF Noyce Award Number: 0934886
Principal Investigator: Linda T. Coats
Email: yjc16@msstate.edu
Institution: Mississippi State University
Co-PI(s): Bruce Ebanks, Tommy Stevenson, Buurnette Hamil, William Person, Dana Franz, Debbie Beard, Svein Saebo, and Walter Diehl
**Title:** TECHS-NJ: Integrating Probes and Sensors into Math and Science Lessons  
**NSF Noyce Award Number:** 0630412  
**Principal Investigator:** Bruce Bukiet  
**Email:** bukiet@m.njit.edu  
**Institution:** New Jersey Institute of Technology, Rutgers University  
**Co-PI(s):** Arthur B. Powell, Ismael Calderon, Gayle Griffin  
**Presenter(s):** Arthur B. Powell, Rutgers University-Newark, powellab@rutgers.edu  
**Project Discipline:** Mathematics, Science  
**URL(s):** techsnj.njit.edu  

The Teacher Education Collaboration for High-Need Schools’ New Jersey (TECHS-NJ) Robert Noyce Scholarship Program is a collaborative project of New Jersey Institute of Technology, Rutgers University -Newark, the Newark Public Schools and the Newark Museum. Through the program, our goal is to train 26 mathematics, science and engineering majors for careers as math and science teachers for the city of Newark and other high-need districts.

**Title:** STEM Teachers Acquired Through New Directions in New Mexico (STAND-NM)  
**NSF Noyce Award Number:** 0934919  
**Principal Investigator:** Jennifer J. Neakrase  
**Email:** neakrase@nmsu.edu  
**Institution:** New Mexico State University  
**Co-PI(s):** Susan Brown, Stephen Kanim  
**Presenter(s):** Jennifer J. Neakrase, New Mexico State University, neakrase@nmsu.edu  
**Project Discipline:** Science Teacher Education; Physics Education  
**URL(s):** http://www.facebook.com/pages/NMSU-Noyce-Scholars-Program/211741488859076  

Traditionally, the certification of science and mathematics teachers at New Mexico State University has been only part of the secondary education program in the College of Education. Within this program, secondary education is declared as a student’s undergraduate major when they...
enter the university. Students then select a specific discipline (e.g., physics or mathematics) as part of the certification. In science this is a general science license, rather than a discipline specific license. Alternatively, students who already hold an undergraduate degree can receive their secondary license through a Master of Arts program as graduate students. As part of the traditional program students take a very limited number of discipline specific courses. Previous to the Noyce Scholar grant, there was no option for science or mathematics majors to receive a secondary teaching license without switching majors away from their discipline or entering the Masters program. STAND-NM, an NSF Noyce funded program, provides a new option for science, mathematics, or engineering majors to pursue secondary licensure in science or mathematics while finishing their undergraduate degree within their originally declared major. This poster introduces the program at NMSU and discusses both difficulties in recruitment and program accomplishments.

70
Title: NYU’s Noyce Fellowship Program
NSF Noyce Award Number: 0733805
Principal Investigator: Pamela Abder
Email: pamela.abder@nyu.edu
Institution: New York University
Co-PI(s): Jalal Shatah, Allan Mincer, Joseph McDonald
Presenter(s): Samantha Tulloch, New York University, skt253@nyu.edu
Project Discipline: Science Education and Math Education
URL(s): steinhardt.nyu.edu/noyce

The New York University (NYU) Noyce Scholarship Program advertises among NYU and NYU-Poly STEM-major undergraduates to recruit them into secondary school math and science teaching. The Program prepares them for careers as teachers in high-needs schools by providing: (1) early familiarity with effective secondary school teaching; (2) a sense of secondary school teaching as a good career path for scientists and mathematicians; and (3) accelerated preparation for full professional certification as secondary school teachers. The Program assists with job placement in high needs secondary schools and supports early career teachers. Thus far, the Program has: (1) admitted 9 students to the master’s program as Noyce Scholars, 5 or whom have graduated and are now completing their first year of teaching in high-needs schools (four with a two-year teaching commitment, one with a one-year commitment), and 4 of whom are presently completing their masters’ programs and preparing to begin teaching in September 2011. The program has also enrolled 4 new Noyce Fellows to begin their master’s program in June 2011, and has directed a number senior students to other teacher preparation programs in math and science secondary education. Four of the first NYU Noyce Scholars helped conduct a conference at NYU attended by more than 200 public school science teachers, school district personnel and University students and faculty to discuss math and science teaching in urban schools. The Noyce Scholars explored the perspectives of urban students on math and science education by holding a panel discussion with students from New York City public schools. The Noyce Scholars discussed with these students their own experiences teaching diverse student populations. The discussions were videotaped and were presented, with analysis, by the Scholars at the 2010 annual Noyce Conference.

71
Title: Recruit and Engage Math and Science Teachers (RE-MAST) Newberry College
NSF Noyce Award Number: 0934802
Principal Investigator: Cindy Johnson-Taylor
Email: cindy.johnson-taylor@newberry.edu
Institution: Newberry College
Co-PI(s): Christina McCartha, Charles Horn, Randall Key, and Renee Stubbs
Presenter(s): Christina McCartha, Sherri Kennedy, Newberry College
Project Discipline: Chemistry, Biology, Math, Education

Newberry College is dedicated to preparing high school math and science teachers through its Recruit and Engage Math And Science Teachers (RE-MAST) program, a collaboration between the biology and chemistry, math and education departments, and 3 high need SC school districts.

In Year Two of RE-MAST, a Master Teacher, strong in math content, worked specifically with the RE-MAST Program. The Master Teacher uses her own classroom experiences to provide support to RE-MAST mentors, teacher candidates and prospective students. The Master Teacher is in charge of science and math education recruitment with assistance from science, math and education faculty, organizing the scholar and summer intern recruitment activities, organizing summer internship experiences, and serving as liaison to partner high need school districts for RE-MAST activities. Lastly, the Master Teacher will provide induction support to RE-MAST graduates out in the field.

Specifically, the RE-MAST program is working to recruit, prepare and mentor 26 math, biology and chemistry majors...
pursuing teaching in STEM content areas. In Year One, ten interns participated in the summer internship and eight of those are now pursuing secondary certification in a STEM content area. In Year Two, nine interns will have completed the summer internship. In Year Two, seven Noyce/RE-MAST scholars were selected and have completed one year of study in secondary education. One Noyce Scholar has graduated. In Year three, six scholars are returning to the program and five new scholars are joining the program.

RE-MAST selected 12 STEM teachers from the three high need school districts to participate in the Master Mentors program thereby enhancing the infrastructure for education. They received Foundations of Mentoring training in Year Two that counted towards professional development hours. Mentors also met on campus four times throughout Year Two to talk about the program and engage in professional development. Mentors work with RE-MAST interns, scholarship recipients and graduates for their wo year service obligation.

The Master Mentor program promotes teaching, training, and learning by pairing RE-MAST students with highly trained mentors in their content area to help them develop their skills as teachers in the classrooms within high need schools. In June 2011, mentors will complete Learning Focused Schools training, as part of the RE-MAST program, to enhance their ability to work with teacher candidates.

During Year Two, interns, scholars, mentors and faculty attended several conferences. Math majors attended the South Carolina Council for Teachers of Mathematics Conference (SCCTM) while science majors attended the South Carolina Science Council Conference (SC2). All participants were invited to attend the Southeastern Regional Noyce Conference held in March 2011 and co-hosted by Clemson University and Newberry College. The poster session will provide an overview of progress made in Year Two.

72
Title: Kenan Master Teaching Fellows: Linking Research Experiences and Curriculum Development with Leadership
NSF Noyce Award Number: 0934658
Principal Investigator: Ruben Carbonell
Email: ruben@ncsu.edu
Institution: North Carolina State University
Co-PI(s): Valerie B. Brown-Schild
Presenter(s): Valerie B. Brown-Schild, North Carolina State University, Valerie_Brown-Schild@ncsu.edu

Carrie Lynn Brewington, ctskate@ymail.com, Hoke County High School
Project Discipline: STEM
URL(s): www.KenanFellows.org

This five-year grant from NSF’s Robert Noyce Teacher Scholarship Program allows the Kenan Master Teaching Fellows (KMTF) Program to link 18 experienced teachers with university, industry and community college researchers. As a result of this grant, teachers have become more informed about important new scientific developments, built their leadership skills and are in the process of developing curricula that support economic development sectors unique to the region such as aerospace, sustainable energy/green technologies and advanced medical technologies.

The KMTF will complete two-year fellowships and subsequently engage in a range of leadership activities in their home districts to benefit other teachers, administrators and students during their three years as Alumni Master Teachers. As Master Teachers, they will also assist in local schools of education in the preparation of new teachers.

The Kenan Fellows Program for Curriculum and Leadership Development at North Carolina State University provides 18 effective classroom teachers the opportunity to gain STEM related experience through local businesses, educational institutions, and research centers. Teachers use these experiences to make new lessons relevant and meaningful in an effort to improve K-12 STEM education in high-need schools. Teachers learn about practices and skills that characterize the innovative, high-tech labs and industries in the area. Teachers work in a specific cutting-edge research area to learn about new developments in research and scientific practices to become effective teacher-leaders and change agents.

The objective is to prepare students to be “future ready” for the work force and higher education with STEM-related experiences and opportunities by creating a real-world perspective through teacher experiences.

73
Title: Mathematics Teachers as Scholars, Designers, and Technology Leaders
NSF Noyce Award Number: 0733794
Principal Investigator: Hollylynne Lee
Email: hollylynne@ncsu.edu
Institution: North Carolina State University
Co-PI(s): Karen Hollebrands, Irina Kogan, and Roger Woodard
The Noyce Mathematics Education Teaching Scholars [Noyce METS] at NC State aims to increase the number of highly qualified mathematics teachers prepared with a major in a mathematical science and a major in mathematics education. Thus far the program has funded 20 scholars, 14 of whom will be teaching by Fall 2011. A new cohort of six scholars will also begin in Fall 2011. Our scholars develop an understanding of mathematics needed for teaching, and are well-prepared to be leaders in technological innovation to improve student understanding in mathematics classrooms. They have worked together to take a scholarly lens on the development and implementation of many instructional strategies and tasks. They also critically analyze results of implementation as a community of professionals. Our scholars are highly engaged in preservice and inservice years in schools that serve high need students. Within the next two years we plan to more closely document their impact in the field.

Title: ND Scholars Filling the Void
NSF Noyce Award Number: 0833268
Principal Investigator: Lisa Montplaisir
Email: Lisa.Montplaisir@ndsu.edu
Institution: North Dakota State University
Co-PI(s): Erika Offerdahl, William Martin, and Donald Schwert
Presenter(s): Lisa Montplaisir, North Dakota State University, lisa.montplaisir@ndsu.edu
Project Discipline: Biology, Chemistry, Math, Engineering

The goal of the Noyce Scholars program at North Dakota State University is to increase the number of science and mathematics teachers who seek jobs in high-needs schools in rural and Native American communities across ND and in regional areas in SD and MN. Our objectives are to target 1st and 2nd year science majors for summer internship opportunities and 3rd - 5th year STEM majors to dual enroll for a teaching credential. We have recruited 16 Scholars thus far, four of whom have graduated. Two are teaching in high needs schools and two are interviewing in high needs districts. Twenty 1st and 2nd year Interns have been in the program, four of whom have become Scholars. There has been early success for our Scholars program. Noyce Scholars have been able to negotiate contracts before graduation, schools have been contacting us for student-teacher placements, and Scholars have been actively seeking high needs schools for early experience placement opportunities. Programmatic obstacles have included lack of participation of Noyce Scholars in national and regional meetings, limited interactions between Noyce Scholars within a cohort, difficulty in recruiting Scholars that will be qualified to enrich teaching and learning in the T and E of STEM, and providing resource bridges to Teacher Scholars to establish stronger programs in their schools. Leadership obstacles that are being addressed include providing Scholars with resources (access to materials), mentoring, and collaboration as they begin teaching, and continuing university contacts as Scholars want to become leaders in science/math teaching, but rural placements provide collaborative challenges to advance their career.

Title: PRIME: Preparing Regional Increases in Mathematics Educators
NSF Noyce Award Number: 0934709
Principal Investigator: Teri Murphy
Email: murphytj1@nku.edu
Institution: Northern Kentucky University
Co-PI(s): Gina Foletta and Bethany Noblitt
Presenter(s): Bethany Noblitt, Northern Kentucky University, noblittb@nku.edu

Northern Kentucky University (NKU) and the Kentucky Center for Mathematics (KCM) selects talented undergraduate students interested in mathematics education and prepares them to be fully qualified, well-prepared teachers who will teach secondary mathematics in high-need schools. The university provides them on-going support during their early teaching years. The project is a collaboration between the KCM, NKU, and three school districts: Covington Independent and Newport Independent Schools in Kentucky and Cincinnati Public Schools in Ohio. The project supports two-year scholarships to a minimum of 28 academically talented students in their junior and senior years and summer internships for up to 30 rising freshman and sophomores.

The program includes the following elements: an aggressive recruiting plan; opportunities for incoming freshmen and rising sophomores to engage in summer experiences designed to stimulate their interest in becoming secondary mathematics teachers working in high-need schools; two-year scholarships for carefully selected, academically talented students in their junior and senior years; an outstanding teacher preparation program including valuable
enhancements that foster a community of learners and expose participants to contemporary literature on, and effective practices in the teaching and learning of secondary mathematics; and mentoring and coaching support for program graduates.

We had our first group (six students) of incoming freshmen and rising sophomores participate in summer internships during summer 2010. Our second group (three students) will intern in summer 2011. These summer internships include opportunities such as working as undergraduate researchers under the mentorship of faculty members and/or assisting with summer camps sponsored by NKU’s Center for Integrative Natural Sciences and Mathematics as well as the College of Education and Human Services.

Our first cohort of scholarship recipients consisted of five students, awarded scholarships for the spring 2010. Our second cohort (fall 2010) of scholarship awardees consisted of two students; our third cohort (spring 2011) consisted of three students; our fourth cohort (fall 2011) consisted of four students. Enhancements for these cohorts have included: a state conference which focused on “Implementing the New Mathematics Standards,” teacher panel discussions about “Teaching High School Mathematics in High-Need Schools,” a session presenting the impact of KY Senate Bill 1 and the New Mathematics Standards on Teaching High School Mathematics, the National Council of Teachers of Mathematics Annual Meeting which focused on “Geometry: Constructing and Transforming Perspectives.”

76
Title: Northern New Mexico College Noyce NSF Scholars Program
NSF Noyce Award Number: 1035465
Principal Investigator: David Torres
Email: davtytorres@nnmc.edu
Institution: Northern New Mexico College
Co-PI(s): Cathy Berryhill, Fangyang Shen, and Ivan Lopez
Presenter(s): David Torres
Northern New Mexico College, davtytorres@nnmc.edu
Project Discipline: Mathematics

The Noyce Program at Northern New Mexico College (NNMC) seeks to recruit teachers from STEM (Science, Technology, Engineering and Math) undergraduate majors or graduates with BS degrees in STEM fields. The NNMC Noyce Scholars Program provides $12,000 per year scholarships for students who will teach two years for each year of scholarship award. This goal is being achieved through collaboration between the Math & Science, Engineering and Educational departments. Currently, four NNMC students participate in the program, attend Noyce seminars and will assist with the Summer Bridge Math Program at NNMC.

77
Title: Oakland University Noyce Scholars Program: Building Capacity to Better Train Teachers for High Needs Schools
NSF Noyce Award Number: 0934724
Principal Investigator: Mark Olson
Email: olson2@oakland.edu
Institution: Oakland University
Co-PI(s): Christine Abbott and Jerrold Grossman
Presenter(s): Mark Olson, Oakland University, olson2@oakland.edu
Project Discipline: Secondary Mathematics, Physics and Chemistry
URL(s): www.oakland.edu/noyce

The initial cohort of six 2010-2011 NSF-Oakland University Noyce Teaching Scholars have just completed their 13-month post-BA teacher certification program. Three physics, one chemistry, one mathematics and one integrated science teacher have been certified. Additionally, we are beginning work with the second cohort of eight NSF-OU scholars (two physics, 3 mathematics and 3 integrated science). We describe both the opportunities and challenges engaged in our work with the initial cohort of Noyce Scholars including the development of new partnerships with mentors in high needs schools and our efforts to focus our program directly on the preparation of science and mathematics teachers for high needs schools. The impact of this initial cohort on our work for the second has been significant. We have expanded our initial set of schools for placements and are building on the initial success of collectively observing exemplary teachers as a cohort—as in a medical rounds model. We recognize the need of our scholars to see a broader range of teaching examples and of students who are successful in high needs schools. We also present evaluation efforts including initial findings based upon interviews, surveys, classroom observations and other instruments. Particularly interesting are our efforts to use the Science and Mathematics Program Improvement (SAMI) observation protocol as both a tool for program evaluation as well as an approach toward lesson study. We call this approach the "Collaborative Study of Instruction" or CSI and are iteratively working to improve how we use video artifacts of practice to enhance the development of teaching skills in the Noyce Scholars. We are very excited about our initial progress and look forward to improvement as we move forward with the second cohort.
Title: OxyMS Teaching Scholars - Occidental College  
NSF Noyce Award Number: 0934962  
Principal Investigator: Adelina Alegria  
Email: alegria@oxy.edu  
Institution: Occidental College  
Co-PI(s): Chris Craney  
Presenter(s): Adelina Alegria, Occidental College, alegria@oxy.edu  
Project Discipline: Science/Mathematics  
URL(s): http://departments.oxy.edu/education/noyce/  
http://departments.oxy.edu/education/  

The OxyMS Teaching Scholars Project was developed to identify and support highly qualified math and science majors and STEM professional who can mentor and teach in the urban high schools of Los Angeles. Our recruitment practices include classroom and social organization presentations, advertisement booths, orientation meetings, postcards mailings, and electronic advertisement. These practices have attracted a number of math and science undergraduates ready to begin the education program consisting of math and science methods courses. To support our Scholars in their teaching, they enroll in the course, *Math and Science Pedagogies for Secondary Teachers*, which includes extensive fieldwork with culturally and linguistically diverse students, inquiry-based instruction, and critical pedagogy. After our candidates complete their Level-1 credential and they begin teaching, they participate in a State-wide induction program, which support their pedagogical and content development further. Our poster will showcase our First and Second Cohorts Teaching Scholars as well as our recruitment strategies, mentoring practices, course of study, and student teaching experiences.

Title: Building a Noyce Scholar’s Learning Community  
NSF Noyce Award Number: 0833295  
Principal Investigator: Ralph Martin & Jeff Connor  
Email: martin@ohio.edu  
Institution: Ohio University, Shawnee State, Univ of Rio Grande  
Presenter(s): Ralph Martin, Ohio University, martin@ohio.edu  
Jeff Connor, Ohio University, connorj@ohio.edu  
Al Cote, Ohio University, cote@ohio.edu  
Lauren Metcalf, Ohio University, lauren.metcalf@gmail.com  
Project Discipline: Mathematics and Science(s) for Middle and High School teacher preparation  
URL(s): http://seocems.org/noyce.shtml  

SEOCEMS Noyce Scholar’s program is developing a Noyce Learning Community as a means of support for Noyce Scholars during their initial preparation and induction years of teaching. The Noyce Learning Community is supported through a variety of systems: on-line learning network, an annual conference, and scholar mentors during Noyce teaching requirements and classroom observations. SEOCEMS Noyce Learning Community has just operated its second cohort for the electronic Noyce Learning Network. Our poster session will discuss the preliminary findings of this pilot study. We will discuss the successes and pitfalls encountered along the way, and will reveal initial findings from an accelerated pilot for a revised teacher preparation program.

Title: The Mathematics Studio Program  
NSF Noyce Award Number: 0934953  
Principal Investigator: Thomas Dick  
Email: tpdick@math.oregonstate.edu  
Institution: Oregon State University  
Co-PI(s): Rebekah Elliott, Linda Foreman, and William Rhoades  
Presenter(s): Thomas Dick, Oregon State University, tpdick@math.oregonstate.edu  
Project Discipline: Mathematics  
URL(s): http://www.teachersdg.org/  

The studio math classroom grew out of lessons learned from the Oregon Mathematics Leadership Institute project (an NSF MSP project). It is a model for developing leadership, mentoring, and fostering professional learning, and the studio classroom provides a platform for a professional learning community to focus on student mathematical thinking. Resident teachers, preservice interns, and administrators collaborate with a peer - the Studio Teacher - and a consultant to explore math content in the context of a mathematics lesson that involves a live classroom enactment of teaching practices being discussed. The goal is enhanced student success, as defined by students engaging habitually in mathematical practices, high achievement on state exams, equity in achievement for all subgroups of students, and increased participation and success in advanced high school math courses. This Noyce project involves both Teaching Fellows and Master Teaching Fellows as participants in the studio math classroom.
81
Title: Our Lady of the Lake Noyce Program: Highlights of the Year
NSF Noyce Award Number: 0531956
Principal Investigator: Isabel Ball
Email: balli@lake.ollusa.edu
Institution: Our Lady of the Lake University
Co-PI(s): Peggy Carnahan
Presenter(s): Isabel Ball, Our Lady of the Lake University, balli@lake.ollusa.edu
Project Discipline: Science and Mathematics
URL(s): www.olusa.edu

Our Lady of the Lake University’s (OLLU) Department of Education and Center for Science and Mathematics Education (CSME) have collaborated for six years in the preparation of other-than-teaching science and mathematics careerists to be science and mathematics secondary classroom teachers. Forty-seven students have been accepted into the program. Most have completed a Masters of Arts in Education degree and are teaching in grades 6-12 classrooms. The certification program that served these students was offered as a weekend and evening program and designed to be completed in two years, while some took one or two years longer. In their internship year, they were hired with a one-year State Probationary Teaching Certificate allowing them to be employees in one of the 11 districts that collaborated with OLLU/Noyce. As of Fall 2010, the weekend/evening course schedule, district employment, and Noyce funds enabled 23 persons to become teachers and enter the classrooms of high needs schools. There are 10 more students expected to be in the classroom by the end of 2011.

In addition, Noyce students and graduates are invited to participate in professional development workshops and presentations which are regularly offered by OLLU’s Center for Science and Mathematics Education. The participants not only learn fresh and best practices for classroom use, but receive updates on State policies, curriculum alignment, certifications in laboratory safety, and demonstrations of new laboratory equipment, mathematics tools and materials, etc. The students also enjoy the networking these sessions afford. They learn from and benefit from the enthusiasm of the more experienced teachers.

In the summer months of 2010, Noyce teachers participated in the following hands-on workshops: Start-up: First Days of School, Physics for All, Up in Space-Down on Earth, and G.L.O.B.E. Certification. In addition, teachers and students attended the Conference for the Advancement of Science Teachers and the Conference for the Advancement of Mathematics Teachers.

82
Title: Pacific University STEM Teaching Pathways
NSF Noyce Award Number: 0934599
Principal Investigator: Kevin Carr
Email: kcarr@pacificu.edu
Institution: Pacific University
Co-PI(s): Juliet Brosing
Presenter(s): Juliet Brosing, Pacific University, brosing@pacificu.edu
Project Discipline: STEM
URL(s): http://www.pacificu.edu/coe/stem/noyce_scholarship.cfm

Pacific STEM Teaching Pathways (PSTP) is an innovative collaboration between the Pacific University Division of Natural Sciences, College of Education, and a consortium of five local Oregon high-needs K-12 school districts, designed to increase the number of exemplary K-12 STEM teachers equipped to serve in high needs schools. PSTP provides academically inspiring, financially manageable, and seamlessly supported pathways into K-12 STEM teaching careers, targeting two specific candidate pools: a) Pacific University undergraduate STEM majors and b) career-changing STEM professionals. PSTP, a comprehensive STEM teacher education recruitment, training, and induction program, will provide up to two years of Pacific Noyce Scholarship support for 35 exemplary STEM teaching candidates, obligating recipients to two years of service in a high needs school district for each year of support received. PSTP will develop and disseminate over the five-year project period a transformative model for attracting, inspiring, equipping, and inducting dynamic and talented STEM majors and professionals into K-12 teaching careers, impacting the education of thousands of diverse students in Oregon’s high needs schools and enriching their communities.

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NSF Noyce Award Number: 0531960
Principal Investigator: N. Bharathan
Email: bharathn@iup.edu
Institution: Pennsylvania State System of Higher Education
Co-PI(s): Peter Garland (PASSHE)
Presenter(s): N. Bharathan, Indiana University of Pennsylvania, Bhaarthn@iup.edu
URL(s): URL: http://www.iup.edu/natsciandmath/noyce/default.aspx
Science and math teacher preparation programs of the Pennsylvania State System of Higher Education (PASSHE) have been undergoing systemic reform since August 2000, under the aegis of the NSF-supported Collaborative for Excellence in Teacher Preparation in Pennsylvania (CETP-PA). As CETP-PA pursues its original mission of science and math education reform and support to pre-service and in-service teachers, its progress thus far has it poised to reach out to science, technology, engineering and mathematics (STEM) students and professionals who desire to attain their education degree and/or teaching certification. CETP-PA, working closely with the PASSHE System Office and the Pennsylvania State System of Higher Education Foundation Inc, to provide scholarships and stipends to STEM majors and professionals who seek their teaching certification at a State System University. The PASSHE is committed to addressing the critical shortage of science and math teachers and the Robert Noyce scholarships and stipends are an extension of the services provided by and through the Math and Science Centers established in the CETP-PA project.

These Centers have in fact become an institutional focus of the 12 CETP-PA universities. The State Foundation monitors the progress of the teachers in meeting their obligation to teach in a high need school district. The Foundation makes contact with both the awardee and the awardee’s employer, distributing written surveys by electronic means that are completed, certified and returned to the Foundation. Project activities involve the Scholarship committee working to: create the application forms, and establish specific criteria and procedures for awards; prepare term sheets, information releases and loan documents for awardees; and prepare public information (brochures, webpage information.). Recruitment is done by distribution of program information, including scholarship/stipend applications, to University Math & Science Centers, faculty advisors, admission officers, distance learning administrators, and to CareerLink Centers.

Since spring of 2006, the Robert Noyce Program in Pennsylvania has given over $180,000 in scholarships (18) and stipends (five). Two students also utilized the scholarship for professional development. The College of education at Indiana University of Pennsylvania (IUP) has started the evaluation process of the cohort of students who have received the ward. The evaluation and monitoring phase will be completed 5-6 years from project start, BUT could continue for at least 8 years for the last cohort of awardees.

84
Title: The Noyce Program at Saint Joseph’s University
NSF Noyce Award Number: 0934713
Principal Investigator: Sandra Fillebrown
Email: sfilebr@sju.edu
Institution: Saint Joseph’s University
Co-PI(s): Karen Snetselaar, Michael Clapper, Michael McCann, and Tetyana Berezovski
Presenter(s): Sandra Fillebrown
Project Discipline: Mathematics and Natural Sciences
URL(s): www.sju.edu/5yrmsed

The Noyce Program at Saint Joseph’s University has three major components. First, freshmen and sophomore math and science majors can apply for our 6 week summer internship program. The third cohort of Noyce Interns are working with two charter schools in Philadelphia: Philadelphia Electric and Technology Charter High School and Maritime Academy Charter High School. The Noyce interns work with teachers providing summer enrichment activities in math and science. Second, students enrolling in our 5-year BS/MS programs in math and science education are eligible for scholarships during their senior and fifth year. We currently have 7 scholars at various points in their program. And third, students are supported in their beginning teaching careers through the Urban Teacher Collaborative. These monthly meetings are led by Michael Clapper, and discussions focus on various issues of importance to the teachers.

85
Title: Facing the Challenge: Recruiting Undergraduate Scholars at San Diego State University
NSF Noyce Award Number: 0434150
Principal Investigator: Kathy S. Williams
Email: kwilliams@sunstroke.sdsu.edu
Institution: San Diego State University
Co-PI(s): Meredith Houle and Alexander Chizhik
Presenter(s): Kathy S. Williams, San Diego State University, Biology, kwilliams@sunstroke.sdsu.edu
Project Discipline: Science and Math

To help deal with the staggering need of science and mathematics teachers in the San Diego region, a total of 30 students have been accepted into the San Diego State University (SDSU) Noyce Scholar program over the past five years. Twelve have been biology majors, one chemistry, 15 mathematics, and two physics majors. Of that number, 22 have gone on to teach in middle and high school math and science programs. Eight biology students have entered our
Recruiting undergraduates into the SDSU Noyce program has been very challenging recently. Despite various strategies, only two of 21 scholars were supported by the program as juniors or seniors in the first four years of our Noyce award. In addition, only 4 of those 21 scholars had Biology specializations. In Spring 2009, we renewed our recruiting efforts, and have accepted 6 outstanding undergraduates to fund through their senior semesters of college, and all have applied to, or are now in, teacher credential programs. In addition, eight of the nine scholars recently inducted have been Biology majors. All are completing their credential programs.

We have attracted prospective teachers, by taking making presentations to large numbers of students in select biology courses and working with academic advisors. However, other programs for excellent students compete with our Noyce recruitment. At SDSU, our students first complete a discipline major and then enter into a one-year post-baccalaureate teaching-credential program. Continuing and augmenting this strategy, we seek to improve our program by engaging and recruiting even more potential science and mathematics teachers early and throughout their undergraduate programs, thereby developing their motivation to become teachers. Recent challenges our program faces include limited admissions to credential programs and new teacher placement.

86
Title: Summary of REMAST Summer Conference 2011
NSF Noyce Award Number: 0733691
Principal Investigator: Sharon Vestal
Email: sharon.vestal@sdstate.edu
Institution: South Dakota State University
Co-PI(s): Larry Browning, Matthew Miller, Kenneth Emo, and Madhav Nepal
Presenter(s): Madhav Nepal, South Dakota State University, Madhav.Nepal@sdstate.edu
URL(s): http://www.sdstate.edu/remast/index.cfm

Rural Enhancement of Mathematics and Science Teachers (REMAST) is a Robert Noyce Scholarship Program at South Dakota State University designed to increase the number of science and math teachers and enhance their abilities during preparation and their first years of teaching. The program received supplemental funding from the Noyce program to conduct a mentoring program of the alumni and host a summer conference. The first REMAST Summer Conference was held in June 2011, and this poster will highlight the conference presentations by alumni, faculty, and area teachers as well as a special presentation by Tom Bloch, former CEO of H & R Block. The poster will include reflections by the participants on the conference and suggestions for next summer’s conference.

87
Title: Examining Global Climate Change at the Regional Level: Results from the 2011 SEU Noyce Scholars STEM Partnership Academy
NSF Noyce Award Number: 0833123
Principal Investigator: Steven Fletcher
Email: stevenf@stedwards.edu
Institution: St. Edward’s University
Co-PI(s): Alice Sessions, Bill Quinn, and Cynthia Naples
Presenter(s): Steven Fletcher, St. Edward’s University stevenf@stedwards.edu
Bill Quinn, St. Edward’s University, billq@stedwards.edu
Cindy Naples, St. Edward’s University, cynthian@stedwards.edu
Project Discipline: Science, Mathematics
URL(s): www.stedwards.edu/noyce

This poster presentation describes the summer activities of the SEU Noyce scholars as they explored global and local climate change science through a six-day summer STEM academy. Participants worked with local high school students on the Texas coast and examined regional and global issues related to climate change education through field-based study. Additionally, the scholars developed lesson plans related to environmental science and field-based work with 6-12 students.

88
Title: Science Teacher Education Stony Brook University
NSF Noyce Award Number: 1035314
Principal Investigator: Keith Sheppard
Email: keith.sheppard@stonybrook.edu
Institution: Stony Brook University
Co-PI(s): Lisa Berger and Linda Padwa
The goals of the project are to: 1) recruit highly qualified individuals into science and mathematics teaching careers; 2) prepare effective, competent science and mathematics teachers, knowledgeable in their content areas and familiar with all aspects of standards based education; 3) provide a host of early teaching experiences to prepare the awardees for student teaching and the early years of their teaching careers; 4) support the science and mathematics teachers in their induction years through the assistance of more senior Noyce scholars; and 5) evaluate the Noyce programs with respect to their success in recruiting, preparing and retaining teachers in the high needs schools of the region.

The NSF Noyce Phase II Scholarship and Stipend builds on our previous successful NSF Noyce Phase I award. In our phase I project we awarded forty-four scholarships and four stipends to prospective science and mathematics teachers who committed to teach in high needs schools. Based on analysis of the results of the Phase I award and feedback from participants, the Phase II proposal expands and enhances our commitment to working with high needs schools in the region and New York City. Eight two-year scholarships will be awarded to attract talented undergraduate science and mathematics majors to enter the teaching workforce. Twenty-five, one-year scholarships will be awarded to STEM professionals undertaking teacher certification studies through our MAT programs. Eight two-year stipends will be awarded to graduates of our programs, who have committed to continue to work in high needs schools and who will both contribute to and liaise with our teacher education programs and in-service professional development activities.

New activities in the Phase II awards include: 1) the provision of extensive field experiences for pre-service teachers, 2) the incorporation of changes to our teacher preparation methods courses to better prepare students to work in high needs schools, 3) the extension of our teacher induction activities. The monitoring and evaluation of the Phase I and Phase II outcomes will be expanded as will our dissemination of results of our findings through publications and presentations at national conferences.

**89**

**Title:** SUNY Cortland Noyce Project

**NSF Noyce Award Number:** 0934777

**Principal Investigator:** Greg Phelan

**Email:** gregory.phelan@cortland.edu

Institution: SUNY Cortland

Co-PI(s): Rena Janke, Larry Klotz, Mary Gfeller, and Anne Burns-Thomas

Presenter(s): Kerri Freese, SUNY Cortland, kerri.freese@cortland.edu

**Project Discipline:** Science and Math

**URL(s):** www.cortland.edu/ployce

The SUNY Cortland Noyce Project seeks to encourage talented science, technology, engineering and math (STEM) majors to become K-12 teachers in high-need rural and urban school districts. Scholarships are also available for professionals (who already have a bachelor’s degree in a STEM major) seeking to become K-12 teachers. The Noyce Project proposes to award 50 scholarships totaling $670,000. Thirty-five scholarships (10 graduate and 25 undergraduate) have been awarded to 27 Noyce Scholars. The average GPA of undergraduate Noyce Scholars at time of application is 3.6. Sixty-nine applications were received by the end of the Project’s second year ending May 31, 2011.

Primary recruitment methods include campus and community outreach, press releases, website articles and Scholar spotlights, campus and alumnae newsletters, posters, and admission packet flyers. A new Noyce Scholar workshop series, addressing issues related to successfully teaching in a high-need environment, was planned and initiated during the spring 2011 semester. Thirty-two Noyce Scholars, teachers from local high-need districts, faculty and staff participated. The average overall rating for the workshop was 4.9 out of 5. The second workshop is planned for fall 2011.

Data collection is ongoing. Data has been collected from online surveys, external evaluator interviews, and workshop questionnaires.

The Fredonia Robert Noyce Scholarship Program has awarded 22 Scholarships to date, and we plan to award an additional 10 more for the incoming Masters in Arts of Teaching (MAT).
graduate program cohort this summer. Of the 22 Scholars, 7 are program completers, 11 are still in progress, 4 are on leave or seeking employment. Six of the seven program completers are teaching in high needs schools; the seventh is teaching in a teacher shortage area in central NYS. We have had significant increases in our recruiting of new scholars upon the approval of our graduate certification program. This allows candidates to “switch” from STEM to STEM education at the graduate level without significant increases in the time required in college. We have begun to shift our focus to provide greater support for novice teachers as they commence their teaching in high needs schools. We are doing so with an online learning community for all program scholars and alumni in addition to a Scholar Forum that dovetails with the methods courses in the MAT program. We also plan to provide professional development, especially in the form of NSTA national conferences for the Novice Teachers. In our experience, new teachers are at a point in their career where such professional development is critical for the identification of curricular resources and strategies and, to connect with other science teachers and informal science education agencies.

91
Title: Recruitment of high school STEM Teachers through the Robert Noyce Teacher Scholarship Program at Buffalo State College
NSF Noyce Award Number: 1035360
Principal Investigator: Luanna Gomez
Email: gomezs@buffalostate.edu
Institution: SUNY-Buffalo State College
Co-PI(s): Jane Cushman, Catherine Lange, Dan MacIsaac, Joseph Zawicki, David Wilson, Susan McMillen, and David Henry
Presenter(s): Jane Cushman, Buffalo State College, cushmanjr@buffalostate.edu
Co-Presenter: Carol Yamarino, Buffalo State College
Project Discipline: Mathematics and Physics

In January 2011, the National Science Foundation Robert Noyce Scholarship Program awarded up to $750,000 to the NSF-Noyce New Math and Science Teacher Partnership of Western New York at SUNY-Buffalo State College. The partnership builds on existing Science, Technology, Engineering and Mathematics (STEM) teacher preparation programs designed to address the shortage of math and physics teachers in New York’s high needs schools by increasing the number of preK-12 STEM teachers who are both certified and well-qualified. Noyce scholarships have been used to recruit and foster the development of new STEM teacher candidates through a variety of paths of entry into teaching. In return for receiving financial support, participants are committed to teach for two years in high needs districts for each year of scholarship support.

92
Title: Successes of the SUNY-College at Oneonta Noyce Scholars Program
NSF Noyce Award Number: 0934857
Principal Investigator: Paul Bischoff
Email: bischopj@oneonta.edu
Institution: SUNY-Oneonta
Co-PI(s): Jim Ebert, Todd Ellis, Paul French and John Schaumlöffel
Presenter(s): Paul J. Bischoff, SUNY-Oneonta, bischopj@oneonta.edu
Project Discipline: Secondary Biology, Chemistry, Earth Science and Physics
URL(s): http://www.oneonta.edu/academics/noyce

Awarded in 2009, the Noyce Scholars program at SUNY College at Oneonta has had much success. Recruitment efforts have generated a large pool of applicants and the entire cohort of accepted Noyce Scholars (n = 24) is in place. Our most outstanding success thus far has been in motivating Noyce Scholars from suburban and rural areas to seriously consider careers in the New York City Public School system. To achieve this heightened motivation, nine Noyce Scholars spent 2 weeks in January 2011 participating in a variety of NYC schools. Analysis of pre and post experience journal entries and reflection data show that most of the nine participants are eager to teach in the NYC school system upon graduation. Other major accomplishments include the generation of a tightly connected cohort of scholars; engagement in science education research; operation of a science summer camp for rural middle school students; and, collaborations with NASA and astronauts aboard the International Space Station. The Oneonta Noyce Scholars program is very vibrant.

93
Title: The Syracuse University Noyce Scholars Program for Science and Mathematics Teachers (SU-Noyce): Preparing STEM Teachers to Make a Difference in High-Needs Schools
NSF Noyce Award Number: 0934841
Principal Investigator: John W. Tillotson
Email: jwtillot@syr.edu
Institution: Syracuse University
Co-PI(s): JoAnna Masingila, Sharon Dotger, Eileen Strempel, Jason Wiles, Jeffrey Rozelle
The Syracuse University Noyce Scholars Program for Science and Mathematics Teachers (SU-Noyce) is a multi-faceted collaborative project involving the Syracuse University School of Education, College of Arts & Sciences, the Graduate School, and consortia such as our Upstate Louis Stokes Alliance for Minority Participation (LSAMP), partnering with the Syracuse City School District, the Upstate High-Needs Rural Schools Consortium, and a network of informal STEM education centers from across central New York with the goal of increasing the number of highly-qualified science and mathematics teachers teaching in our nation’s neediest schools. The SU-Noyce Project is focused on attracting highly-qualified STEM teachers through an innovative internship program and a research-based teacher preparation program that addresses the Central Tasks of Learning to Teach (Feiman-Nemser, 2001). The SU-Noyce professional development activities and associated field experiences are geared toward responding to the specific learning needs of STEM teachers across all stages of the professional learning continuum including their initial pre-service preparation, their ongoing induction period as beginning teachers, and their continuing professional development as experienced STEM educators. In particular, the SU-Noyce Project has committed to establishing a robust and sustained mentoring and professional development program for our Noyce Scholars during their first three years of teaching in high-needs rural and urban schools to reduce the rate of attrition and to encourage these individuals to remain in high-needs schools beyond their Noyce service obligation period. Our project also features a comprehensive research component based on the IMPACT Project model for gathering extensive data on changes in teachers’ beliefs and classroom practices over time as a result of their involvement in the SU-Noyce Project activities.

Our poster presentation will describe the components of the aggieTEACH Program and the Noyce Scholarship Program. We will demonstrate that our aggieTEACH Noyce Scholars rank high among their peers and that our recruitment efforts in increasing the number of the STEM majors pursuing teaching has been highly successful. We will also showcase program activities that our Scholars have participated in and will spotlight program collaboration among districts and other funded programs of the Center of Mathematics and Science Education linked to the aggieTEACH Noyce Scholarship Program.

Title: Texas Tech (TTUNS) Program
NSF Noyce Award Number: 0833326
Principal Investigator: Jerry Dwyer
Email: jerry.dwyer@ttu.edu
Institution: Texas Tech University
Co-PI(s): Jeffrey Lee, Lawrence Schovanec, Dominick Casadonte, and Tara Stevens
Presenter(s): Jeffrey M. Lee
Project Discipline: Mathematics

The Texas Tech Noyce Scholars (TTNS) program was established in 2009 to recruit upper level math and science undergraduate students for a two-year training program to prepare them as secondary teachers. In an effort to attract high quality, diverse mathematics and science undergraduate majors to the teaching profession, the project also provides...
summer stipends to students who will mentor and tutor students enrolled in Texas Tech summer mathematics programs. To encourage teacher retention in high-needs schools, the program purposely selects students with self-determination, which is defined as high levels of autonomy, competence, and relatedness that are associated with motivation and well-being. The TTNS evaluation plan will assess whether the self-determined Noyce graduates will be less likely to leave the profession and if their public school students will enjoy academic benefits. A study of Noyce 2010 summer participants revealed that the strength of participants’ positive motivational orientations was significantly lower at the end of their summer activities in comparison to that reported at the pre-test. Additionally, participants viewed the autonomy support they received from mentors as lower at the post-test in comparison to the pretest. Qualitative findings indicated that participants learned about teaching, including the challenges as well as the satisfaction, through authentic experiences, which likely resulted in more realistic impressions about the field. Indoctrinating pre-service teachers prior to their student teaching while providing mentoring and support may be an effective strategy to prepare high quality, self-determined math and science teachers who are less likely to leave the profession.

96
Title: Towson University Robert Noyce Teacher Scholarship Program -- Year Two
NSF Noyce Award Number: 0934751
Principal Investigator: David A. Vanko
Email: dvanko@towson.edu
Institution: Towson University
Co-PI(s): Jeff Passe, Todd Kenreich, Donald A. Thomas, Jane L. Wolfson
Presenter(s): David Vanko, Tissa Thomas; Towson University Project Discipline: STEM Education
URL(s): http://www.towson.edu/FCSM/Noyce/

Towson University’s (TU) Noyce program awards scholarships to juniors and seniors who are majoring in STEM fields and who intend to become teachers, and awards graduate stipends for STEM professionals who are seeking certification to teach in the STEM disciplines via the Master of Arts in Teaching program. The program features special recruitment activities, summer activities, induction activities and a monitoring/evaluation program. This program reflects a strong and long-standing collaboration of TU’s Jess and Mildred Fisher College of Science and Mathematics and the College of Education. Towson’s Noyce program is intentionally designed to attract high caliber students whose financial needs might otherwise prohibit their entry into teacher preparation. This is being accomplished through careful coordination with our NSF STEP grant involving TU, Baltimore City Community College and the Baltimore City Public School System currently in its third year, our Hackerman Academy outreach programs, our two NSF S-STEM grants, and several other existing programs that provide opportunities to identify and mentor a diverse pool of teacher preparation candidates.

Five undergraduates and two MAT students were awarded scholarships or stipends in each of our first two years. Intensive recruiting efforts continue to focus on TU STEM majors, particularly TU STEM-secondary education students, and the five or six community colleges that traditionally supply almost half of Towson’s undergraduate population via the transfer pathway. To that end, the project administrator made a presentation this year to the Maryland Association of Deans and Directors of Teacher Education at Community Colleges about our Noyce program.

In this second year we continue to focus on building our Noyce Scholar community through monthly Noyce Scholar events, social networking, and one-on-one interactions initiated by our Noyce project administrator. We have seen several success stories, as well as the challenges of a few Noyce scholars who are experiencing academic problems.

A new issue we face is whether certain academic programs leading to teacher certification can or should be considered “STEM education.” For example, if a secondary education student switches to middle school mathematics or science certification, can they retain their Noyce scholarship? What if they switch to the Towson program in special education/adult mathematics track? Finally, we are faced with at least one graduated Noyce scholar who is in a long-term substitute-teacher position. Does that or should that be counted as fulfilling one year of the scholar’s teaching obligation? We hope to explore answers to these and other questions at the TU Noyce Program poster.

97
Title: Recruiting and Supporting Noyce Career Changers through a Master of Arts in Teaching Program
NSF Noyce Award Number: 0934836
Principal Investigator: Shari Albright
Email: salbrig1@trinity.edu
Institution: Trinity University
Co-PI(s): Jeffrey Nordine, Patricia Norman, and David Ribble
Presenter(s): Jeff Nordine, Trinity University, jnordine@trinity.edu
STEM professionals who choose to enter teaching face a series of challenges that younger students following a more traditional path do not face. These challenges include logistical (e.g., caring for a family while spending all day in school and completing evening classes), social (e.g., revisiting their identity as a student among younger classmates), and financial (e.g., forgoing a year of salary during the M.A.T. program) issues. Such challenges impact potential career changers’ decision about whether complete an M.A.T. degree (rather than pursue an alternative certification pathway) and success within the program. In this poster, we present strategies for recruitment through both formal and informal communication channels and discuss strategies for providing career changers with additional support when preparing for and completing the M.A.T. program at Trinity University. Strategies include individualized readiness plans, interactions with previous M.A.T. students, and designing coursework that makes connections between theory and practice explicit. Our Teaching Fellows have reported feeling prepared to begin the program and well supported throughout their experience.

98

Title: Recruiting Outstanding STEM Majors: The Noyce Summer Internship at Trinity University
NSF Noyce Award Number: 0934835
Principal Investigator: Shari Albright
Email: salbrig1@trinity.edu
Institution: Trinity University
Co-PI(s): Patricia Norman, Jeffrey Nordine, Beatriz Font-Strawhun, and Nancy Mills
Presenter(s): Patricia Norman, Trinity University
pnorman@trinity.edu
Lisa Jasinski, Trinity University
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Nicholas Polito, Trinity University
npolito@trinity.edu
Project Discipline: Education
URL(s): trinity.edu/noyce

With a large number of STEM undergraduate majors, a superlative teacher education program, and a “minority-majority” city in desperate need of highly qualified K-12 science and mathematics teachers, San Antonio’s Trinity University is ideally suited to implement a Phase II Noyce scholarship and stipend program. For many years, Trinity has enjoyed a 100% placement rate for certified teachers who have completed its Master of Arts in Teaching (M.A.T.) program. Thus our problem is not how to place such prized graduates but how to encourage the very best undergraduate STEM majors to become teachers in the first place.

After studying the shortage of math and science teachers carefully and learning from our past Noyce experience, Trinity’s Department of Education concluded that several particular issues must be addressed in our Phase II activities: recruitment, preparation, early-career support, and opportunities for life-long learning. This four-pronged agenda mirrors recommendations from the National Commission on Mathematics and Science Teaching for the 21st Century (2000). This poster focuses on an innovative recruitment strategy: the Noyce Summer Internship.

To support STEM majors to consider teaching early in their collegiate careers, the Noyce summer internship program targets four rising sophomores and juniors. Noyce summer interns complete a 10-week on-campus internship with two distinct components. First, interns serve as teaching assistants and peer mentors for local high school students taking math and science courses through Trinity’s Upward Bound program. Upward Bound is an academic enrichment program for aspiring first-generation and low-income college students. Second, interns simultaneously complete a laboratory-based research project in cooperation with a faculty advisor in their academic major. Summer interns receive a stipend of $4,500, free on-campus housing, training and support for working with high school students in a classroom, an opportunity to collaboration with a faculty member on original research in their academic discipline, and faculty assistance preparing an end-of-summer research presentation and poster.

We report results from the first year of this recruitment program, Summer 2010, including findings from focus group interviews and survey data.

99

Title: The Urban Math And Science Teacher Collaborative
NSF Noyce Award Number: 1035342
Principal Investigator: Eric Todd Quinto
Email: todd.quinto@tufts.edu
Institution: Tufts University
Co-PI(s): Linda V. Beardsley, Barbara M. Brizuela, and Hugh R. Gallagher
2011 NSF Robert Noyce Teacher Scholarship Program Conference

Presenter(s): Hugh R. Gallagher, Tufts University Physics Department, hugh.gallagher@tufts.edu
Eric Todd Quinto, Tufts University Mathematics Department, todd.quinto@tufts.edu
Project Discipline: Mathematics and Science
URL(s): http://go.tufts.edu/noyce

The Tufts University Robert Noyce Teacher Scholarship Program, the Urban Mathematics and Science Teacher Collaborative, is a partnership between the Tufts Education, Physics, and Mathematics departments, the Center for Applied Special Technology (C.A.S.T.), and three Boston public schools. This program was designed to address the critical demand for highly qualified mathematics and science teachers in high-need districts, especially urban communities. To achieve that goal, the program will recruit two cohorts of eight bachelors in mathematics, science (physics, chemistry, biology), or engineering who will pursue a Master of Arts in Teaching (M.A.T.) degree for middle school mathematics or general science, or for high school mathematics or physics. The first cohort of students has been admitted and will begin in summer 2011.

This Scholarship Program was built on the successes from many NSF-supported projects at Tufts, as well as the Urban Teacher Training Collaborative. This year-long residency is optional for students completing the M.A.T. degree, wherein interns work under the guidance of mentor teachers from the first day of school, throughout the whole year. This residency will be required for Noyce Teaching Fellows, and will follow the same model, working under the supervision of Master Teaching Fellows, who are experienced mentors and leaders in their school communities. This mentoring relationship will continue after the Teaching Fellows complete the M.A.T. program, during the first four years of teaching.

In order to fulfill M.A.T. requirements, Teaching Fellows will enroll in either of two graduate-level courses that integrate subject matter and pedagogical content knowledge in the areas of mathematics or physics. These courses are being developed expressly for this program, and will be offered at the participating school sites to encourage participation by Master Teaching Fellows as well as other mathematics and science in-service teachers. Additionally, Teaching Fellows will have the opportunity to work on a project with C.A.S.T. that can lead to Special Education certification.

Finally, this project also has a research and evaluation component that will track the progress of the Noyce Fellows and assess the impact of the program. Data collection will involve conceptual and epistemological surveys, videotaping of classroom teaching, and face-to-face interviews.

100
Title: Tuskegee University Robert Noyce Teaching Scholars in Mathematics and Science Education in the Alabama Black Belt
NSF Noyce Award Number: 0934545
Principal Investigator: Walter A. Hill
Email: hillwa@mytu.tuskegee.edu
Institution: Tuskegee University
Co-PI(s): Carlton E. Morris, Mohammed A. Qazi, Dennis Likens, and Melvin F. Gadson
Presenter(s): Walter A. Hill and Carlton E. Morris
Project Discipline: Biology, Mathematics, Chemistry, Animal Science

This Noyce scholarship program is a partnership of Tuskegee University and seven school districts in the Alabama Black Belt that has been formed to address shortages of science and mathematics teachers in these districts. The program responds to these shortages by encouraging juniors and seniors (Noyce Scholars) majoring in STEM disciplines at Tuskegee to concurrently pursue a second degree in general science education or in mathematics education.

Once all the requirements for teaching certification are complete, for which a fifth year of study is needed, the graduates of the Tuskegee Noyce program assume teaching positions in one of the partnering schools. Equipped with a contemporary mathematics and science teacher education foundation and a solid formation in the STEM content areas, the Noyce program graduates are poised to make a positive impact in augmenting the quality and quantity of highly qualified teachers of science and mathematics in the Alabama Black Belt.

We anticipate recruiting a total of eighteen Noyce Scholars at Tuskegee during this five-year project. In the two years since the project has been instituted, ten STEM majors have joined the Noyce program; two graduated in May 2011 and will start teaching in the partnering districts in the fall. Several of the Scholars are double majors in STEM areas (e.g. biology and animal science or mathematics and computer science).

This poster describes key programmatic aspects of the Noyce Scholarship program at Tuskegee University and its accomplishments to date.
101
Title: Arizona Master Teachers of Mathematics (AZ-MTM)
NSF Noyce Award Number: 1035330
Principal Investigator: Mathew D. Felton
Email: mdfelton@math.arizona.edu
Institution: University of Arizona
Co-PI(s): Rebecca McGraw, Erin Turner, Marcy Wood
Presenter(s): Mathew D. Felton, University of Arizona, mdfelton@math.arizona.edu
Mary Bouley, University of Arizona, marybouley@cox.net
Project Discipline: Elementary Mathematics

Our poster outlines the goals, learning opportunities, and program structure of the Arizona Master Teachers of Mathematics (AZ-MTM) program, which began in the spring of 2011 at the University of Arizona (UA). AZ-MTM aims to work with a cohort of approximately 13 elementary Master Teachers of Mathematics (MTMs) over a period of 4 years. By the end of the program the MTMs will be prepared to take on leadership roles in their schools and district where they will do such work as: promote high quality equitable instruction, serve as mentors, participate in curriculum development, support pre-service teacher education, and develop and implement professional development for in-service teachers.

During the course of AZ-MTM the MTMs will have a variety of learning opportunities, including analyzing artifacts of practice and connecting professional development experiences to their current teaching and their future role as leaders. The MTMs will participate in two mutually supportive strands: (1) professional development and leadership preparation, provided primarily by our partner institutions, such as the AZ K12 Center and Pima County Schools, and (2) mathematics study group, provided by UA mathematics education faculty, which occurs on an ongoing basis each semester.

Our poster also introduces our initial group of MTMs who began the program in the spring of 2011, new MTMs will join this cohort the following semester) and details their reasons and goals for participating in this program.

102
Title: Commitment to Teach in Under-resourced Districts: Prospective STEM teachers’ Perceptions of Students and Families
NSF Noyce Award Number: 0934935
Principal Investigator: Ingrid Novodvorsky
Email: novod@email.arizona.edu
Institution: University of Arizona
Co-PI(s): Debra Tomanek
Presenter(s): Lisa K. Elfring, University of Arizona, elfring@email.arizona.edu
Project Discipline: Science education: biology, chemistry, physics, earth sciences
URL(s): http://noyce.arizona.edu

This study was designed to investigate prospective STEM teachers’ perceptions of students and families who come from low-income households. This is part of a larger investigation designed to understand dispositions, perceptions, and role of identities that underlie prospective and practicing STEM teachers’ commitment to teach in under-resourced districts. Study participants were all Noyce scholars in an undergraduate STEM teacher preparation program.

103
Title: Robert Noyce Scholarship Program for Secondary Education Science and Mathematics Teachers
NSF Noyce Award Number: 0733841
Principal Investigator: Gay Stewart
Email: gstewart@uark.edu
Institution: University of Arkansas, Fayetteville
Co-PI(s): Michael Wavering, Deborah Korth, Adam Huang, and Dennis Brewer
Presenter(s): Michael Wavering, University of Arkansas, Fayetteville, wavering@uark.edu
Project Discipline: Science and Mathematics
URL(s): http://physinfo.uark..edu/Noyce

The Noyce Program at the University of Arkansas just graduated (2011) its third cohort (16 members) of Scholars. They are currently looking for positions as secondary science and mathematics teachers in high needs schools. The first cohort of Scholars (12 members, graduates of 2009) have just finished their second year of employment. They were all employed in science or mathematics classrooms. Nine Scholars have completed their commitment to teach in high needs schools. Of the second cohort of Scholars (11 members, graduates of 2010) eight have finished their first year of employment in high needs schools. Their reports are positive and their impact on student learning is amazing. One Scholar delayed teaching due to a severe illness in the family, another has been unable to find a position but is a long term substitute, and the final Scholar is working for two years with the university in an outreach program, teaching small lessons in a number of high needs schools, promoting college readiness, before beginning his teaching career.
The fourth cohort begins their MAT (Master of Arts in Teaching) program in July 2011. There will be 9: two life/earth science, two physical/earth science, and five mathematics licensures. During this summer, in addition to graduate course work, Scholars attend an enrichment workshop taught by one of the co-PIs on modern technologies that K-12 teachers can use to inspire future students in STEM as well as have the opportunity to interact with previous Noyce Scholars who are invited back to campus to share their experiences as first year teachers in high needs schools.

Candidates for the 2011 Noyce Scholarships applied for graduate stipends. A committee composed of the PI and co-PIs determined the recipients based on desire to teach in a high-needs school and interest in teaching mathematics or science. Currently, the graduate award is $14,500. Since the grant is winding down, there are no undergraduate scholarships for 2011-2012. After completing their undergraduate degree in mathematics, science, or engineering, students who receive Noyce Scholarships start the MAT program in the summer taking six hours of coursework. This includes one methods course in science or mathematics and a general course about the law, ethics, psychology, and philosophy of teaching in schools. In the fall and spring semester, Scholars complete 27 hours of coursework, meeting on campus one day a week and completing internships in three different schools across grade levels 7-12, with at least one placement in a high-needs school. In these internships the Scholars plan lessons, provide instruction, and evaluate student achievement. Scholars also plan and execute an action research project which focuses on instruction and the effects on their students. Two Noyce Scholars in cohort three focused on issues impacting high-needs students during the spring semester for these projects.

104
Title: The Impact of Robert Noyce Summer Internships and Scholarships on Cal Teach Berkeley Undergraduates
NSF Noyce Award Number: 0934951
Principal Investigator: Deborah Nolan
Email: nolan@stat.berkeley.edu
Institution: University of California, Berkeley
Co-PI(s): George Johnson and Xiaoxia Newton
Presenter(s): Nicole Nunes, UC Berkeley, nunesn@berkeley.edu
Project Discipline: Math, Biology, Chemistry, Physics, Earth Science
URL(s): http://calteach.berkeley.edu/

Cal Teach Berkeley awards paid summer internships for lower division students with local professional development, research and outreach institutions. We present our initial findings about the impact of these summer internships on participant’s knowledge and understanding of teaching as well as their desire to pursue a career in teaching. In addition, Cal Teach Berkeley awards Noyce Scholarships to upper division students who commit to completing their disciplinary degree, to obtaining their teaching credential and to teaching math or science in high-need schools. We present the demographics of our Noyce Scholars and an update on their progress as pre-service and beginning teachers.

105
Title: UCI Cal Teach Noyce Summer Intern & Scholarships
NSF Noyce Award Number: 0934928
Principal Investigator: Brad Hughes
Email: bhughes@uci.edu
Institution: University of California, Irvine
Co-PI(s): Sue Marshall, Debra Mauzy Melitz, James Woods, and Beth VanEs
Presenter(s): Brad Hughes, UCI, bhughes@uci.edu
Project Discipline: STEM Education

The UCI Cal Teach Noyce Summer Intern & Scholarships Program has two primary components - the Summer Internships for freshman and sophomores and the Scholarships for senior students involved in their student teaching. The summer internship program provides opportunities for early STEM majors to explore teaching in informal science centers, such as the Aquarium of the Pacific, Discovery Science Center, Crystal Cove Alliance, and Newport Back Bay Science Center. The Noyce scholarships provide funding to offset tuition for STEM majors to concurrently pursue a bachelor’s degree and a teaching credential in a STEM field and complete both degrees in four academic years.

During the 2009-10 academic year, twenty UC Irvine undergraduate students were recruited to participate in a summer internship at informal science centers (ISC). During the 2010-11 academic year, twenty more interns were accepted into the Noyce intern program, three of them are returning ‘Advanced Interns,’ which was added to the program to create a leadership continuum among the undergraduates in the program. Scholarships have not yet been granted since the first cohort of qualified students will occur in the 2011-12 academic year.

As a group, all of the interns have had previous teaching experience at the K-6 and/or 7-12 levels. The Interns are very excited about being part of this Noyce project. They report
believing that it will be an excellent opportunity to improve their technology, teaching, communication, and lesson planning skills and will give them the chance to find out if they would enjoy a career in teaching. The majority of interns are female, which will provide additional female science teacher role models in the secondary schools. Internships are designed to serve as a recruitment tool for finding new STEM teachers and as such 47% (2010) and 27% (2011) of the interns are unsure about pursuing a career in teaching with the coming years of data we will find how well this internship achieves as a recruitment tool. Interns learn skills of video production and editing to support them in Video Club analysis of developing pedagogical skills. Many of these videos will be shown along with the poster presentation. These videos will be edited into documentaries on our program and as a commercial recruitment tool for teaching. As these Interns proceed to become Scholars, their Video Club skills will be applied in online learning communities, and they will also be trained in professional development facilitation skills to encourage them to become teacher leaders beyond their university training.

106
Title: Tipping the Balance to STEM Teaching: Recruiting and Supporting UCLA Undergraduates
NSF Noyce Award Number: 1035164
Principal Investigator: Joseph Rudnick
Email: jrudnick@physics.ucla.edu
Institution: University of California, Los Angeles
Co-PI(s): Arlene Russell, Chemistry and Biochemistry; Jody Priselac, Education; Terri Hogue, Civil and Environmental Education; Bruce Rothschild, Mathematics, UCLA
Presenter(s): Arlene A. Russell, UCLA, russell@chem.ucla.edu
Project Discipline: All STEM fields
URL(s): http://college.ucla.edu/cateach/About_Us/NOYCE_scholars.html

The UCLA Noyce project brings together the School of Engineering, the College of Letters and Science, and the Graduate School of Education and Information Studies to provide opportunities for STEM majors to explore teaching careers through an innovative summer internship in local high-need schools. During the academic year, it provides scholarships for undergraduate STEM majors who are beginning their graduate credential work concurrently with completing their undergraduate degrees. During 2010-11 year, more than 90 students applied for the 40 spaces in the intern program. Of the 40, half were exploring math teaching, half science; half were entering transfer students, half were continuing juniors. The program also supported 16 students working on the joint BS/Credential/MEd programs. These 16 students will complete their credential in summer 2011, begin teaching in September with the support of both a field supervisor and advisor, and complete their MEd degrees in May 2012.

107
Title: University of California Riverside, Robert Noyce Scholarship for Excellence in STEM Teaching
NSF Noyce Award Number: 0934297
Principal Investigator: Pamela S. Clute
Email: pamela.clute@ucr.edu
Institution: University of California, Riverside
Co-PI(s): Maria C. Simani, Bradley Hyman
Presenter(s): Maria C. Simani, University of California Riverside, maria.simani@ucr.edu
Project Discipline: Mathematics and Science
URL(s): http://smi.ucr.edu/noyce.html

Since the summer of 2009, the College of Natural and Agricultural Sciences, the Graduate School of Education and the ALPHA Center for Academic Partnerships at the University of California, Riverside, (UCR) have formed an alliance with the fast-growing, low-performing, nearby Moreno Valley Unified School District, to prepare exceptional science and mathematics undergraduate majors for secondary school teaching careers. The UCR Noyce Scholarship Program builds on the unique pre-credential curricular and training infrastructure established at UCR by the Science Mathematics Initiative and the ALPHA Center, to establish a pathway of teacher preparation and development services which continue towards the UCR Credential Program and the induction phase.

Strong recruitment strategies are embedded into the selection process so as to attract students from underserved populations who have demonstrated content expertise, success in early education coursework and field experiences, and who also have a documented history of commitment to teaching by participating in established UCR teacher-preparation and outreach programs. Eligible undergraduate students may be awarded multiple scholarships for consecutive years to support them throughout the full teacher preparation pathway.

To date, the program includes a total of 33 scholars with 37 scholarships disbursed with a steady increase in the number of selected scholars each year. Over 70% of our scholars are from minority groups, well representing the ethnic population of the students in the classrooms in which they are placed. Noyce Scholars commit to science and
mathematics student-teaching or internship positions in nearby, high-need school districts with a majority of students (40%) placed in Moreno Valley Unified School District. Honors are bestowed upon the Scholars during an annual UCR Noyce Summit event attended by teachers, district administrators and UCR partners. Scholars wear Noyce sashes as part of their academic regalia at the graduation ceremony in spring and in their future academic events.

Progress of the Noyce Scholars is followed longitudinally through internal and external evaluation efforts to determine the impact of the program on their performance as a teacher, commitment to serving the district, impact as a role model in the school, and longevity to the profession.

108
Title: CalTeach Noyce Scholar Program: Partnerships at Work
NSF Noyce Award Number: 0934223
Principal Investigator: Amanda Datnow
Email: adatnow@ucsd.edu
Institution: University of California, San Diego
Co-PI(s): Jeff Remmel
Presenter(s): Chris Halter, UCSD, chalter@ucsd.edu
Project Discipline: STEM Education
URL(s): http://edsserver.ucsd.edu/Noyce/

The UCSD CalTeach Noyce program developed at UCSD is unique among comparable programs. It is through our purposeful partnerships at that the program succeeds. The focus of the courses and fieldwork experiences is on blending deep content knowledge with strong pedagogical practices. Neither the Physical Sciences division nor Education Studies could accomplish this goal in isolation. It is only through ongoing collaboration and partnership that we can bring the strengths of multiple UCSD departments together to create a powerful learning experience for our future science and mathematics teachers. The merging of pedagogy and content occurs at each level of the program and in every course. This consistent theme of the program brings into focus the critical need for deep content knowledge as well as the knowledge of learning within each discipline.

The program is supported by purposeful fieldwork with local school districts, high-needs local schools, and carefully selected mentor teachers. These new STEM students in early field experiences engage in discipline-specific pedagogy and intensive teaching apprenticeship experiences to prepare UCSD undergraduates to enter the graduate intern teacher credential program. The partnerships and field experiences are designed to give the students specific, supported, and scaffolded interactions with veteran classroom teachers and adolescent learners. Faculty in the science departments, mathematics and EDS are in the fourth year of implementing lower-division SMI courses and field experiences.

The program has established two new partnerships with local community colleges. Faculty at Grossmont Community College and Mesa Community College teach transferrable courses from the program, ensuring that their students are on track once they come to the university.

Through the campus partnership between Education Studies Program and the Physical Sciences Division, the courses and experiences of future teachers have been planned and scaffolded to provide them with the tools to make informed and effective classroom decisions. With the local school partnerships, our STEM majors are able to learn about the work of effective urban teachers as well as provide important mentoring and tutoring to local K-12 students creating far reaching impacts on our local community.

109
Title: Math for America San Diego Noyce Teaching and Master Teaching Fellowship Programs
NSF Noyce Award Number: 0934695 and 1035503
Principal Investigator: Guershon Harel
Email: harel@math.ucsd.edu
Institution: University of California, San Diego
Co-PI(s): Barbara Edwards
Presenter(s): Guershon Harel, UC San Diego, harel@math.ucsd.edu
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Barbara Edwards, Math for America San Diego, bedwards@ucsd.edu
Project Discipline: Mathematics
URL(s): www.mathforamerica.org

Math for America San Diego hosts both Noyce Teaching Fellows and Noyce Master Teaching Fellows. The poster briefly describes these two programs, the program goals, and the professional development program which is at the heart of the MfA SD Noyce.

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Title: Growing Noyce Scholars
NSF Noyce Award Number: 0934735
Principal Investigator: Jane Conoley
Email: jane-conoley@education.ucsb.edu
Institution: University of California, Santa Barbara
At the University of California, Santa Barbara (UCSB) the Noyce Scholars program creates a transition between our undergraduate Minor in Science and Mathematics Education and our graduate Teacher Education Program (TEP) as well as provides professional development activities for current scholars and Noyce alumni. In response to the shortage of qualified secondary science and mathematics teachers, nine of the University of California campuses created the Science and Mathematics Initiative (SMI) to recruit and mentor talented science and mathematics undergraduates for careers as secondary science and mathematics teachers. As part of SMI, the UC campus at Santa Barbara formed the Minor in Science and Mathematics Education in 2009. Currently, 22 students have graduated with the minor, and 43 students are signed up for the minor as of winter 2011. The success of the minor is due in part to the collaboration among multiple departments at UCSB. Classes for the minor are offered through 7 different departments on campus. The Minor in Science and Mathematics Education allows students to experience teaching first hand in local schools through the classroom placements that are part of the requirement for a number of minor courses. These classroom experiences also help students fulfill the preprofessional requirement for admittance into teacher education programs. In addition, these experiences allow students to determine if teaching is their passion.

Over the last three years, Noyce funding has been used to recruit Teacher Education Program candidates from students who take classes in the minor. There are two core classes for the minor, one focusing around science and the other around mathematics. Each quarter, announcements are made about the availability of Noyce scholarships for students who enter the TEP at UCSB for single-subject science or mathematics credentials. In addition, a recruitment event is held each year where students who are science and mathematics majors, as well as those who are enrolled in the minor, can attend and learn about the TEP. At those events the Noyce scholarships are highlighted and current Noyce Scholars can answer questions about the program.

Since the initiation of the grant, the number of students coming into the TEP with the minor has steadily increased. This bridge between the two programs has led to better prepared students within the TEP. Once the Noyce Scholars are in the TEP, we continue their professional development through activities that include talks from innovative teachers in the community, Performance Assessment for California Teachers preparation support, job search techniques, and opportunities to network with UCSB faculty, Noyce alumni, and current Noyce Scholars.

111
**Title:** Robert Noyce Teacher Scholars Program at the University of California, Santa Cruz (UCSC)
**NSF Noyce Award Number:** 0833340
**Principal Investigator:** Gretchen Andreasen
**Email:** gha@ucsc.edu
**Institution:** University of California, Santa Cruz
**Co-PI(s):** Sheldon Kamieniecki, Art Ramirez, Paul Koch, and Lora Bartlett
**Presenter(s):** Gretchen Andreasen, UC Santa Cruz
**Project Discipline:** Physical Sciences and Mathematics
**URL(s):** http://calteach.ucsc.edu

At the University of California Santa Cruz (UCSC), all Robert Noyce Teacher Scholars have completed a mathematics or physical science undergraduate major and are enrolled in the post-baccalaureate, 12-month, M.A./credential program. Since the program began in 2009-10, we have funded 14 scholars to complete a math teacher credential, 2 for chemistry, and 1 for physics. Funding remains for 15 additional scholarships, which we anticipate awarding over two years. For 2011-12, the program at has accepted its third and largest cohort to date, with seven scholars entering in July (six math, one chemistry). For the coming year, three graduates will continue for a second year at their positions in regional high-need schools; three scholars from the first cohort and all four from the second cohort are seeking employment for 2011-12. UCSC’s Noyce Scholars are recruited from the pool of undergraduates who participated in UCSC’s Cal Teach program, a sequence of undergraduate internships in middle and high school science and math classrooms accompanied by weekly seminars, and now incorporated into several undergraduate majors and minors.

Noyce supplement enabled us to expand recruitment beyond the typical Cal Teach pool with a summer internship program.
This effort, in its third and final year in summer 2011, places ten first or second year college students each summer in instructional settings where they work with both underserved student populations and with high-achieving populations. The program goal is to recruit additional prospective Noyce Scholars into the Cal Teach pipeline.

Scholars in the first cohort (2009-10) were periodically interviewed and observed in their student teaching classrooms in order to examine their developing professional identities as math and science teachers and their evolving commitment to teaching and to teaching in high-need schools. Four of these scholars were employed in regional high-need schools in 2010-11, and they were interviewed for the same purpose several times throughout their first teaching year. In addition, evolving teacher commitment is now being assessed via an annual survey for all Cal Teach interns (~350 students have completed ~590 internships since spring 2006).

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Title: Chicago UTEP Math and Biology: A New and Innovative Residential Teaching Program

NSF Noyce Award Number: 0934845
Principal Investigator: Kavita Kapadia
Email: kkapadia@uchicago.edu
Institution: University of Chicago
Co-PI(s): Paul Sally and Michael LaBarbera
Presenter(s): Douglas O’Roark, the University of Chicago, dougoroark@uchicago.edu
Project Discipline: Mathematics and Biology
URL(s): http://uei.uchicago.edu/teachers/utep/index.shtml

The University of Chicago’s Urban Teacher Education Program expanded in 2009, from training only elementary teachers to preparing teachers for secondary math and biology. This intensive residential teaching program includes several novel features that are innovative.

Students in Chicago UTEP prepare for two full years at the university before earning a master’s degree and teaching certification. They are explicitly prepared for teaching within the Chicago Public School system, and for their first three years of teaching following graduation they receive bi-weekly coaching sessions and attend monthly induction meetings with other graduates of the program. This demanding residential program requires students to complete five separate clinical experiences, including a full year of tutoring at the university’s charter high school, two semester long student teaching placements in public schools in Chicago, as well as placements in two consecutive summers. Students are supported, during these placements, by attending weekly seminars explicitly tied to their practicum.

Coursework, throughout the two year program, requires first-rate content knowledge in math or biology, as well as the development of pedagogical content knowledge, through a series of eight second year courses developed for the program. For example, mathematics students take a Situational Mathematics’ courses taught by Paul Sally and other members of the university’s mathematics department, courses that foster a deep understanding of fundamental mathematics that provide a rigorous underpinning for the school mathematics Chicago UTEP graduates will teach. In Biology, students complete a Biology Capstone sequence that, for example, helps students connect their study of biology to local resources in Chicago.

Other elements of UTEP’s program are built on the framework of the pre-existing elementary education program. In particular, UTEP attends to issues of race, class, and culture through a sequence of first year seminars called Soul Strand. The fieldwork strand consists of 10 to 15 visits to a variety of public high school and middle schools in Chicago (including neighborhood, charter, and magnet schools). This work, along with tutoring and a Foundations of Education sequence, is tied together through major first year projects including a school study, child study, and teacher study.

One final element of Chicago UTEP is worth mentioning. The students in the program are united through a cohort structure, where students who enter the program simultaneously can expect to work together for five years, from the first internship year, followed by residency, and then three years of induction. This invaluable support structure, combined with attention to rigorous mathematics and science and to the vital cultural issues surrounding working in an urban area, makes Chicago UTEP unique.

Chicago UTEP secondary will graduate its first students this July, with all graduates starting teaching jobs in underserved communities on Chicago’s south and west sides. Currently 19 students are enrolled in the first or second year of the program, with a goal of expanding to 30 to 40 students per year within three years. UTEP’s elementary education program has an over 90% retention rate within the public school system in Chicago in its eight years of existence, and the secondary component seeks similar results.
In the years we have been working with the NOYCE scholarship program, we have determined that there are four clusters of characteristics that are needed for scholars to be successful in the program and in classrooms. As part of our ongoing effort to continue to develop an excellent cadre of STEM teachers, we are developing tools to understand our scholars’ strengths in each of these 4 areas when they arrive in the program, how the program draws on these strengths to develop areas of relative weaknesses, and the impact of these relative strengths and weakness as the scholars teach in the future. At this time we are in the early stages of developing these tools, but can present these early results from current scholars and discuss the progress of scholars who are now teaching.

In the years we have been working with the NOYCE scholarship program, we have determined that there are four clusters of characteristics that are needed for scholars to be successful in the program and in classrooms. As part of our ongoing effort to continue to develop an excellent cadre of STEM teachers, we are developing tools to understand our scholars’ strengths in each of these 4 areas when they arrive in the program, how the program draws on these strengths to develop areas of relative weaknesses, and the impact of these relative strengths and weakness as the scholars teach in the future. At this time we are in the early stages of developing these tools, but can present these early results from current scholars and discuss the progress of scholars who are now teaching.

This poster will highlight our Phase II grant activities at the University of Colorado-Boulder. We will share results from our recruitment strategies, which are closely tied to early undergraduate experiences in the Colorado Learning Assistant program and the CUTeach certification program. In 2010/2011, we had 19 Noyce Scholars with majors in mathematics, biological sciences, chemistry/biochemistry, and physics. These scholars worked on research and curriculum design projects with faculty in STEM departments and in the School of Education, with K-12 science teachers, and within the broader STEM education community in Boulder Valley. We will summarize the structures that have worked for sustaining and growing our Noyce Scholarship program and share current evaluation data from the project.

The Noyce Scholarship Program involves recruitment activities, newly developed coursework, and internships for freshmen and sophomores to increase both the number of mathematics majors who pursue secondary teaching and the quality of their preparation. Thus far, approximately 18 freshman and sophomores have participated in summer or academic year internships. These opportunities include summer school settings, math and science camps, and academic year tutoring.

The Hawaii Noyce Teacher Scholarship (HiNTS) project begins with aloha. HiNTS unifies the educational efforts and resources of the University of Hawaii at Hilo (UHH), Hawaii
Community College and University of Hawai‘i Maui College, and several Hawaii Department of Education (DOE) complexes on the islands of Hawai‘i, Molokai, Maui, and Lanai. HiNTS provides three-year scholarships along with educational technology to 10 future secondary mathematics teachers, while establishing a robust support structure of ongoing professional development and collaboration in mathematics education.

Unique to this project, is its focus on designing and implementing pedagogical models that meet the specific needs relating to Hawaii’s vast cultural and economic diversity. The project provides a Math Camp, professional development, and mentoring. The collaboration among UHH, the community colleges, and Hawaii DOE, allows the HiNTS faculty and scholars to fine tune the delivery of secondary mathematics instruction meeting the challenges of individual partnering complexes and schools. HiNTS scholars are uniquely positioned to develop innovative pedagogical approaches in mathematics, focused on teaching ethnically diverse classrooms. The first cohort of 5 HiNTS scholars has just begun!

Title: University of Houston NOYCE Scholarship Program
NSF Noyce Award Number: 0833342
Principal Investigator: Laveria F. Hutchison
Email: lhutchison@uh.edu
Institution: University of Houston
Co-PI(s): Jeffrey Morgan
Presenter(s): Laveria F. Hutchison, University of Houston, lhutchison@uh.edu
Susan Williams, University of Houston, sewilliams@uh.edu
Robert Houston, University of Houston, rhouston@uh.edu
Project Discipline: Mathematics and Science
URL(s): www.teachhouston.uh.edu

Recruiting and selecting candidates that meet our criteria for NOYCE scholars can be quite challenging. Our program has employed a variety of recruiting strategies to find mathematics and science certification seeking students who meet our high standards at both the undergraduate and graduate levels. These strategies have ranged from recruitment websites to more direct forms of recruiting through job fairs and presentations held on our campus. Each semester, our programs evaluate the recruiting strategies used and modify our plan according to the data results. Intertwining our program admission criteria with our NOYCE selection criteria has allowed for focused recruitment plans further aiding in our success at finding NOYCE scholars. Similar to our variety of recruiting strategies, we employ an array of selection and interviewing tools aimed at uncovering the strongest candidates for admission into our programs. Our poster presentation will share our successes with recruiting and selecting candidates, data collected that shows the student achievement impact NOYCE scholars have made in school settings, stories from our scholars and lessons learned for continued growth and success.

Title: Year One of UHD NOYCE: A Good Beginning
NSF Noyce Award Number: 0934913
Principal Investigator: Larry Spears
Email: spearsl@uhd.edu
Institution: University of Houston - Downtown
Co-PI(s): Akif Uzman, Brad Hoge, and Jon Aoki
Presenter(s): Larry Spears (spearsl@uhd.edu)
Project Discipline: Natural Science

The UHD NOYCE Science Teacher Scholarship Program officially began activities in June 2010 at the UHD NOYCE Summer Workshop. Participants included the first cohort of four NOYCE Scholars, their assigned master teachers in science and other invited teachers from the Aldine Independent School District (AISD). The workshop was led by Maikel Garcia, a high school physics teachers from the Spring ISD, who used his experience with the Modeling Instruction in Physics Program, developed at Arizona State University, (http://modeling.asu.edu/modeling-hs.html) to provide hands-on experiences for workshop participants. Topics included Energy, Mechanics, Density, Electricity, Engineering, and STEM Pedagogy.

In the Fall of 2010, the NOYCE scholars were grouped with AISD mentors and UHD faculty mentors to form NOYCE teams. They met face-to-face and also used a web-based interface, HUNSTEM (Houston Urban Network for Science, Technology, Engineering, and Mathematics) to communicate and consider numerous pedagogical issues and challenges. HUNSTEM was developed in the UHD Department of Natural Sciences in collaboration with numerous educational venues across Texas as a medium to exchange pedagogic information and network science teachers with the scientific community of the greater Houston Area. NOYCE students and mentor teachers used the HUNSTEM forum and blog to discuss issues such as the role of social networking in science education and innovative problem-based learning strategies.

NOYCE students also participated in CAST, the annual convention of the Science Teachers Association of Texas. NOYCE scholars will prepare hands-on workshops for the next
CAST meeting in the Fall of 2011. NOYCE teams continued to meet during the spring of 2011 in preparation for their upcoming student teaching experiences. Classroom visits were added to the online assignments, and the NOYCE students reported on their experiences through HUNSTEM. Three new NOYCE students have been recruited for the 2011/2012 academic year. These students will join existing teams at the 2011 summer workshop focusing on Teaching Science Outdoors. The overall goal of the UHD NOYCE program, is to produce 26 science baccalaureate graduates, who have also satisfied Texas science teaching certification requirements, and accepted employment as a secondary science teacher. With seven students in the pipeline at the end of Year One, we are off to a good start.

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Title: The Noyce Program for Early START STEM Students and Career Changers at the University of Louisville
NSF Noyce Award Number: 0934787
Principal Investigator: Nancy C. Martin
Email: nancymartin@louisville.edu
Institution: University of Louisville
Co-PI(s): Christine Rich, Thomas Riedel, Thomas Tretter, and William Bush
Presenter(s): Nancy Caroline Martin
Project Discipline: Math and Science
URL(s): http://louisville.edu/education/ssa/noyce/

Our Noyce Program, a partnership between the University of Louisville, the Jefferson County Public School System and Teach Kentucky, has evolved since submission of our proposal. Originally the program targeted junior and senior students to recruit a highly qualified diverse cohort of STEM majors to enter mathematics and science teaching through the EARLY START program. This program allows junior and senior level undergraduates to complete up to nine credit hours of graduate course work in education concomitant with completion of their disciplinary degrees. These double counted credits also apply towards a Masters of Arts in Teaching (MAT degree). In the past year we expanded our cohort to include career changers who will enter the 4 semester MAT program. Some of our career changers are newly minted STEM majors while others have been in the workforce. To date, we have four EARLY Start students and five career changers enrolled in our program.

We continued all of the outreach efforts reported previously. In addition, we used a survey instrument to determine the effect of personal letters from chairs to 179 students with qualifying GPAs. 59 responded to the questionnaire and 78% indicated they did not know about the Noyce program. Thus, additional strategies for getting the word out about the Noyce program need to be developed. We are currently making new posters to put in all relevant departments, our communications and marketing department is working on a story about current scholars, STEM departments will offer a course for exploring teaching for STEM credit, and we have included a description of the Noyce opportunity in the University of Louisville President’s e-gram that goes to 10,000 alumni. Finally, we have expanded our partnership with Teach Kentucky to include recruiting.

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Title: The Teach Next Year Noyce Scholars for Teaching Program Gets A Visit from President Obama
Institution: University of Massachusetts at Boston
NSF Noyce Award Number: 1035247 & 0532038
Principal Investigator: Lisa M. Gonsalves
Email: lisa.gonsalves@umb.edu
Institution: University of Massachusetts, Boston
Co-PI(s): Brian White
Presenter(s): Danielle Wheeler
Project Discipline: We prepare teachers in Biology, Chemistry, Physics, Math, Earth Science, and Middle School Math and General Science
URL(s): http://www.umb.edu/academics/departments/cehd/programs/curriculum_instruction/programs/acceleratedprograms/teachnextyear.html

The Noyce Program at UMass/Boston had a very successful and exciting year in 2010-2011. It was wonderful when President Obama visited a classroom at TechBoston Academy that was taught by a graduate of the Teach Next Year program, which Noyce funds. President Obama was invited to James Louis’ classroom because Louis is seen as a master teacher of biology. Equally exciting was the fact that Louis has a current intern who is also funded by the Noyce Program. (Please see our poster for pictures from this exciting event!)

The 2010-2011 year marks our sixth year of Noyce funding and our 11th year as a residential teacher preparation program. This year we expanded to six schools in two high need school districts. We also prepared a record 18 STEM candidates, eight in science (with two in chemistry) and eight in math, four of whom were of color. In January 2011, the Boston Public School system, began working to place all of our STEM interns into full time teaching positions, a wonderful development given the current state of the economy. Finally, this year the Noyce Scholars program at
UMass/Boston received a Phase II Noyce grant from NSF. We have just completed the application process for next year and 13 students will receive Noyce Scholarships, seven in science and six in math. This is in addition to another five STEM interns who will be funded by another program. This makes a total of 18 STEM teacher candidates, seven of whom are of color. We are excited that our STEM teacher preparation program continues to grow with Noyce and NSF support!

In terms of research, the Noyce PI, along with colleagues from the College of Education, has been working on developing a model for evaluating resident teacher preparation program like the one that Noyce funds at UMB Teach Next Year. We have presented this model at the 2010 Noyce conference and at AERA. We hope to publish the results soon.

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Title: University of Massachusetts Dartmouth Robert Noyce Teaching Scholarship Program
Where are They Now? Thoughts on the Noyce Program from former and current Noyce Scholars as well as Recruiting Activities/Results

NSF Noyce Award Number: 0833266
Principal Investigator: Patricia Crowley
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Institution: University of Massachusetts, Dartmouth
Co-PI(s): Tesfay Meressi, Frank Scarano, Stephen Hegedus
Presenter(s): Patricia Crowley and Kimberly Welty University; of Massachusetts, Dartmouth
Project Discipline: STEM majors
URL(s): http://www1.umassd.edu/cusp/noyce/

The University of Massachusetts Dartmouth Robert Noyce Teaching Scholarship Program is now in its third year. With the first class of graduates working as full-time teachers in local high-needs schools, this poster will share their thoughts on their first year out of the program. In addition, the second cohort of Noyce Scholars is wrapping up coursework and will share their thoughts on the program. The poster will also illustrate recruitment efforts and results for the past academic year.

122

Title: FUTURE and UNITE at the University of Michigan

NSF Noyce Award Number: 0934678
Principal Investigator: Brian Coppola
Email: b coppola@umich.edu
Institution: University of Michigan
Co-PI(s): Mary Starr and R. Charles Dershimer
Presenter(s): Mary L. Starr, University of Michigan, mastarr@umich.edu
R. Charles Dershimer, University of Michigan, Dersh@umich.edu
Brian Coppola, University of Michigan, bcoppola@umich.edu

In our poster, we will describe two initiatives at the University of Michigan that are creating a new pipeline for Noyce fellows. FUTURE provides undergraduate students opportunities to interact with classroom teachers around special projects in middle and high school science and mathematics classes. These highly qualified undergraduates collaborate with each other, university faculty and with the classroom teacher to identify, plan and then implement a short set of teaching experiences. The FUTURE students are also provided teaching experiences in a summer camp program at the IDEA Institute. We expect, and are beginning to see, that the FUTURE program encourages students to investigate more formal teaching opportunities as career choices and are beginning to move into the newly created teacher preparation pipeline UNITE.

123

Title: Project IMPACT: Improving Mathematics, Physics and Chemistry Teaching

NSF Noyce Award Number: 0833250
Principal Investigator: Gillian Roehrig
Email: bill0041@umn.edu
Institution: University of Minnesota
Co-PI(s): Cynthia Cattell and Terry Wyberg
Presenter(s): Barbara Billington, University of Minnesota, bill0041@umn.edu
Project Discipline: Physics, Chemistry, Earth Science, Mathematics

The current focus of our work is on the use of video reflection in both science methods courses and induction course. We use two video tools: VideoAnt and the Teacher Performance Assessment (TPA).

VideoAnt has been used as a reflective tool to supplement observations made by our student teaching supervisors. This system allows both the supervisor and student teacher to reflect on practice in “real-tim,” and for comments made by a supervisor to be tied more directly to a specific teacher action or event during the lesson rather than as an encapsulated summary of the observation. Most critically, it provides a tool for self-reflection on classroom practice for our student teachers. While the use of video as a reflective tool is not new, the VideoAnt system has afforded two critical
new features that are important to note. To work effectively and efficiently in an on-line environment, the system has to be easy to use so that teachers are reflecting on practice and not spending time on video editing, etc. With the advent of Web 2.0 and MP4 ready cameras, this process is as easy as transferring a file from your jump drive to your desktop; it requires no editing and is seamlessly loaded into the VideoAnt system by a server that automatically formats different video files. Second, it allows for “real-time” reflection on practice and provides a stronger platform for reflection as the reflection is directly connected to specific classroom events.

The TPA is designed to be an authentic assessment which evaluates a teacher through four tasks; 1) lesson planning, 2) instructing and engaging students, 3) student learning through assessment, and 4) an overall reflection on three to five days of teaching. While the TPA’s authentic tasks are intended to be used for both student teacher evaluation as well as teacher education program evaluation, the focus of our research is on teacher candidates - and more specifically on what evidence the TPA reveals about science education teacher candidates’ understanding of inquiry-based instruction.

124
Title: Top Notch Teachers’ with Dual Degrees at the University of Missouri (T2D2@MU)
NSF Noyce Award Number: 0934839
Principal Investigator: Patricia Friedrichsen
Email: FriedrichsenP@missouri.edu
Institution: University of Missouri
Co-Pl(s): John Adams, Allan Whittington, Dorina Kosztin, Mark Volkmann, Marcelle Siegel
Presenter(s): Patricia Friedrichsen, University of Missouri, FriedrichsenP@missouri.edu
Project Discipline: Science
URL(s): http://t2d2.missouri.edu/index.html

The goal of our project is to double the number of secondary science teachers graduating from our undergraduate teacher education program. Our project supports the recruitment, development and retention of secondary science teachers through internships and scholarships. We are in the second year of our project. Our specific project activities include:

- **Internships.** We are in the second year of offering 10 -week summer internships to enable freshmen and sophomores to explore their interest in science teaching. The internships take place at informal science settings. Partners include the St. Louis Science Center, Science City in Kansas City, Missouri Department of Conservation Nature Centers across Missouri, and MU Office of Science Outreach.

- **Dual Degrees.** We have established new dual degree programs to enable students to complete two degrees, in the College of Arts & Science and in the College of Education, with a minimum of additional credits. Science disciplines include Biology, Chemistry, Physics, and Geology.

- **Scholarships.** In years 3-5 of our project, we will offer $11,000 annual scholarships to qualified juniors and seniors in our undergraduate science teacher education program who are in dual degree programs.

- **“Exploring Science Teaching as a Career” course.** We have revised an existing one-credit course to help students exploring science teaching as a career, and we are offering the course each semester.

- **Noyce Scholar Support Network (NSSN).** As beginning teachers, Noyce scholarship recipients will participate in this online, social networking tool developed for use in the SMAR2T program (MU’s alternative certification program).

125
Title: MU Noyce Scholars Program for Science and Mathematics Teachers
NSF Noyce Award Number: 0832765
Principal Investigator: Patricia Friedrichsen
Email: friedrichsenp@missouri.edu
Institution: University of Missouri
Co-Pl(s): Fran Arbaugh, Oscar Chavez, John Adams, and Alan Whittington
Presenter(s): Marilyn Soucie, University of Missouri, souciema@missouri.edu
Project Discipline: Mathematics and Science Teacher Education
URL(s): www.smar2t.missouri.edu

The goal of this Noyce-funded project, is to recruit more highly qualified individuals into careers in mathematics and science teaching. In particular, we recruit individuals with undergraduate degrees (or higher) in mathematics or science who are planning to change career paths into the field of teaching. These students are prepared through SMAR2T: Science and Mathematics Academy for the Recruitment and Retention of Teachers, an alternate route to certification. The Noyce program will provide 42 stipends of $10,000 each to qualified STEM professionals who hold a baccalaureate,
masters, or doctoral degrees in mathematics, science, or a related field. These students are obligated to teach mathematics or science for two years in a high need school district (preferably in Missouri) within 4 years of program completion. We will also create an online social network for SMAR2T/Noyce students and graduates to provide continuing emotional and pedagogical support.

126
Title: Tomorrow’s Teachers with Dual Degrees in Mathematics and Mathematics Education
NSF Noyce Award Number: 1035446
Principal Investigator: James Tarr
Email: tarrj@missouri.edu
Institution: University of Missouri
Co-PI(s): Barbara Reys and Carmen Chicone
Presenter(s): James Tarr and Victor Soria
URL(s): http://tdm2.missouri.edu

Tomorrow’s Teachers with Dual Degrees in Mathematics and Mathematics Education is aggressively working to double the number of secondary mathematics teachers graduating from the University of Missouri’s undergraduate mathematics teacher education program through the recruitment of mathematics majors into mathematics teaching careers, preparation of these individuals to teach mathematics aligned with national standards, and support of mathematics teachers in their induction years. The project is providing summer mathematics teaching internships, dual degree programs (B.S. in Mathematics and B.S. Ed. in Mathematics Education), and $10,000 annual scholarships for those committed to teaching mathematics in high-need school districts. To increase teacher retention, the project will develop a cadre of mentor teachers in partner schools and supporting Noyce Scholars’ participation in professional mathematics teacher conferences.

127
Title: Pre-scholarship Internships: How Do Perspectives Change? A Qualitative Comparison
NSF Noyce Award Number: 0833185
Principal Investigator: Arthur Louis Odom
Email: alodom@umkc.edu
Institution: University of Missouri, Kansas City
Co-PI(s): Charles J. Wurrey, David Ketchum; Lynda S. Plamann, and Clare Bell
Presenter(s): Stuart Phipps, University of Missouri--Kansas City, phippsst@umkc.edu

The purpose of this report is to describe changes in the ways that participation in pre-scholarship school internships influence participants’ perceptions of what it means to be a science teacher and to teach in high-need schools. Interns write pre- and post-internship essays about high school science teaching. The participants’ essays provide evidence of changes in beliefs. Expectations shifted from being relatively romantic toward being relatively pragmatic.

128
Title: NebraskaNOYCE
NSF Noyce Award Number: 1035268
Principal Investigator: Jim Lewis
Email: wlewis1@unl.edu
Institution: University of Nebraska, Lincoln
Co-PI(s): David Fowler, Doug Kauffman, Ira Papick, Wendy Smith, and Stephen Swidler
Presenter(s): Jim Lewis, University of Nebraska-Lincoln, jlewis@math.unl.edu
URL(s): http://scimath.unl.edu/noyce/

NebraskaNOYCE was funded in September 2010; our first cohorts of Teaching Fellows and Master Teaching Fellows begin June 6, 2011. We have spent our time planning the TF and MTF programs, recruiting and selecting participants, and getting everything in place to launch the programs in Summer 2011. Through our fall and winter recruitment and subsequent interview and selection process, we awarded 6 TFs for 2011/12. We hope to then award 10 TFs for 2012/13. The TFs participate in a newly-developed master’s degree program at UNL that is completed across two summers and one academic year: the Master of Arts with an emphasis on Mathematics.

The selection process was very difficult, as we had to turn away some outstanding master teachers. During the application and interview process, we gave preference to teachers who were teaching in high-need schools within their high-need districts, were already deeply involved in leadership activities, and whose vision of leadership went beyond their own classroom and school.

To demonstrate mathematical knowledge, we chose the Praxis II Mathematics Exams (0069 for K-8 applicants, 0061 and 0063 for 9-12 applicants). We were looking for applicants to score at least 165 on the middle level test, and to average 160 on the two high school exams. Among accepted MTFs, the average middle level score was 186; the average high
school content score was 180, and proofs score 190. Among accepted TFs, the average content was 164, and average proofs score was 180.

Surveys will be administered to participants to collect data for pre-post analyses on a range of outcome variables. The evaluation will track the progress of participating teachers, examining changes in participant outcomes, including the extent to which they take on leadership roles and responsibilities and commit to teaching in high-need schools. Interviews will be conducted with a sample of project leaders, participating faculty, TFs and MTFs, and school administrators to acquire perceptions related to program features, challenges, successes, and student success. Interviews will especially focus on teacher leadership and how to increase levels of student success in mathematics in high-need schools. The evaluation will examine facilitators and impediments to implementation and progress toward sustainability of project activities through interview, focus group, and observation data.

129
Title: NebraskaSCIENCE Scholars: UNL’s Science Teacher Scholars Program
NSF Noyce Award Number: 1035358
Principal Investigator: Jon Pedersen
Email: jep@unl.edu
Institution: University of Nebraska, Lincoln
Co-PI(s): Beth Lewis, Tiffany Heng-Moss, and Dan Claes
Presenter(s): Jon Pedersen and Beth Lewis
Project Discipline: Science and Science Education
URL(s): http://www.unl.edu/scimath/

The goal of the University of Nebraska-Lincoln’s UNL Science Teacher Scholars Program is to engage science professionals in the development of the knowledge, skills, and dispositions (NSB, 2008) necessary to meet the challenges of the 21st century secondary science classroom. Students holding a minimum of a baccalaureate degree in a science content area matriculate through a 42-credit hour Master of Arts in Science Teaching (M Ast). The new 14-month MAst program will provide an increase in the number of science teachers certified at UNL and the NSF Noyce scholarships ($12,000 each) pay for all in-state tuition and fees for 14 students each year for four years during the program. Upon graduation, these new science teachers will be supported during their induction to teaching through our New Teacher Network (NTN). The intent of this poster presentation is to share critical components to the initial stages of our program: (1) collaborations among three colleges, the College of Arts & Sciences, Agricultural Sciences and Natural Resources, and Education and Human Sciences; (2) recruiting efforts that encompass multiple university-wide entities, (3) infrastructure and support from administration to initiate the program; and (4) a program design that emphasizes teaching diverse learners of science. The design of the MAst program is to prepare science teachers who understand the learning needs of diverse students (e.g., ELL, special needs, and equity), are empowered to enact teaching strategies that leverage formative assessment practices, and can proactively react to educational issues and policies within their school and district climates.

130
Title: The Robert Noyce Scholarship Program at the University of New Hampshire: Expanding STEM Opportunities through Rural Education
NSF Noyce Award Number: 1035443
Principal Investigator: Sharon McCrone
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Institution: University of New Hampshire
Co-PI(s): Neil Portnoy, Dawn Meredith, Sarah Stitzlein, and Tim Fukawa-Connelly
Presenter(s): Sharon McCrone, University of New Hampshire, smy72@unh.edu
Neil Portnoy, University of New Hampshire, neil.portnoy@unh.edu
Project Discipline: Mathematics, Chemistry, Physics, Biology, Earth Sciences
URL(s): www.unh.edu/noyce

The Robert Noyce Scholarship Program at UNH, is designed to attract highly talented individuals from a range of STEM disciplines, as well as STEM professionals choosing a change of career, to teach science and mathematics in fifth through twelfth grades. Like many states, New Hampshire has a critical shortage of science and mathematics teachers. This need is particularly acute in rural areas, where recruitment and retention of qualified teachers has always been a struggle. To help alleviate the shortage, our program couples strong preparation in content area and pedagogy with clinical experiences in rural settings and provides continued mentoring and professional development relative to the nature of the rural community during the novice teachers’ induction years.

Our poster presentation, will focus on three areas of our project to showcase some of the unique features of the program and to share what we have accomplished during our initial year. These include (a) unique program features, (b) active advertising and recruitment during year one, and (c)
selection of Noyce Scholars. We will highlight what we have done or plan to do, and share some of the challenges faced during year one.

One unique feature of our program is the extent of collaboration across the university and with the participating rural districts. For example, in preparing the original proposal for submission, twelve members of the university community from five different academic departments and from student support programs committed time, expertise and support to program development. Even with this strong commitment, we have encountered challenges of coordination between departments and faculty when publicizing the program and while recruiting and advising student applicants. One challenge we will share is the many questions raised during this process that were not initially anticipated.

We will share details of our Noyce Scholar program, such as the selection process, the summer fellowship component, a public outreach/tutoring/mentoring requirement, and early clinical experiences that bring together students in the sciences. Our program capitalizes on existing connections with the local rural communities through internship agreements in the school districts as well as through the UNH TRIO programs, federally funded educational opportunity programs, such as Upward Bound and Educational Talent Search.

131
Title: You Never Really Know What It’s Like Until You Are There: A Longitudinal Look at our First Group of Noyce Scholars
NSF Noyce Award Number: 0833280
Principal Investigator: Jerry L. Walsh
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Institution: University of North Carolina at Greensboro
Co-Principal Investigator(s): Betty Epanchin and Catherine E. Matthews
Presenter(s): Catherine E. Matthews, University of North Carolina at Greensboro, cmatthews@uncg.edu
Angela Webb, University of North Carolina at Greensboro, awwebb@uncg.edu
Project Discipline: Science
URL(s): http://www.uncg.edu/soe/ExSEL/index.html

The University of North Carolina at Greensboro has concluded its first two years of Noyce scholarships with a program called Project Excellence in Science Education Learning (Project ExSEL). We are now in our third summer of Noyce internships with undergraduates. This poster follows a core group of Noyce scholars who were awarded Noyce scholarships during the academic year before they entered the classroom as full-time teachers. Two of the scholars received the scholarship during their senior year; the third received the scholarship during her first year of a science education M.Ed. program. Though not finished with her degree, she decided to enter the teaching profession after completing her practicum experience. All three of these young women participated in Noyce internships prior to their scholarship years, and all three are currently ending their first years in the classroom. Learn about their perceptions of the Noyce experience and how their experiences as a Noyce scholar in Project ExSEL influenced them during their first years of teaching.

132
Title: Scholarship Team in Action to Recruit STAR Scholarship UNC Wilmington
NSF Noyce Award Number:  0934380
Principal Investigator: Cathy Barlow
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Institution: University of North Carolina, Wilmington
Co-Principal Investigator(s): Karen Wetherill, Paul Hosier, and Martin Posey
Presenter(s): Martin T. Sugerik, UNC Wilmington, sugerikm@uncw.edu
Project Discipline: Science (Biology, Chemistry, Environmental, and Physics), Technology, Engineering, and Mathematics
URL(s): http://www.uncw.edu/ed/grants.html#star
http://www.uncw.edu

Ten high-need school districts in Southeastern North Carolina, an educational business and the University of North Carolina at Wilmington (UNCW) form the STAR (Scholarship Team in Action to Recruit) Program for the purpose of producing more highly qualified STEM teachers for those school districts. The STAR team from UNCW consists of six STEM faculty, six education faculty, and one faculty member on a joint appointment between Marine Science and the School of Education. In an effort to accommodate the busy and demanding lifestyle of their student population, both in class and online instruction is included in the teacher training programs. The goal is to recruit, retain, and induct at least 25 STEM majors and 40 ‘career changers’ into the teaching profession. Twenty-two students have joined the program since the start in 2009 with an average of 3.5 GPA. Five of these candidates are teaching, and at least four more will enter the profession in the fall. Currently, there are 11 potential candidates for our third cohort with an average of 3.42. Three are undergraduate and four are graduate students. The four career changers come from Business Administration and Finance, Biology, Criminal Justice, Psychology, and Marine Biology. STAR recipients consistently
express their gratitude for the opportunity to develop the knowledge and skills to be the very best math and science teacher for the students in Southeastern North Carolina!

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Title: UNT Science and Mathematics Robert Noyce Scholarship Program
NSF Noyce Award Number: 1035312
Principal Investigator: Colleen Eddy
Email: colleen.eddy@unt.edu
Institution: University of North Texas
Co-PI(s): John A. Quintanilla, Lee E. Hughes, and Pamela E. Harrell
Presenter(s): John Quintanilla, University of North Texas, John.Quintanilla@unt.edu
Project Discipline: Mathematics and Science
URL(s): www.unt.edu/noyce

UNT began the first year of Phase II Science and Mathematics Robert Noyce Scholarship Program in the fall 2010. As of April 2011, 10 candidates — 8 undergraduates and 2 graduates — have been awarded scholarships. This will bring a combined total, for both Phase I and Phase II, to 59 scholars. Of the 33, who are currently teaching in mathematics or science classrooms, there has been 100% retention for the two-year teaching requirement and 83% in teaching past the second year. Phase II will see an increase in the number of undergraduate candidates being awarded scholarships because of the implementation of the Teach North Texas Program (TNT), a replication of UTeach. Prior to the implementation of TNT, there was on average 10 undergraduate and graduate science and mathematics teachers produced a year. Currently, TNT has over 175 undergraduate science and mathematics students in the program who are seeking mathematics and science certification.

134
Title: The Noyce Scholarship Program of the University of Northern Colorado
NSF Noyce Award Number: 1035333
Principal Investigator: Robert J. Reinsvold
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Institution: University of Northern Colorado
Co-PI(s): Cathleen Craviotto, Valerie Middleton
Presenter(s): Rob Reinsvold, University of Northern Colorado, robert.reinsvold@unco.edu
Lori Reinsvold, University of Northern Colorado, lori.reinsvold@unco.edu
Jacqueline Medford, Noyce Scholar of University of Northern Colorado, jacqueline_medford@yahoo.com
Project Discipline: Biology, Mathematics, Earth Science, Chemistry, Physics
URL(s): http://mast.unco.edu/programs/noyce/

The Noyce Scholarship Program of the University of Northern Colorado began in September 2010. Our project has five goals: 1) increase the number of science and mathematics teachers graduating from the University of Northern Colorado; 2) increase the number of STEM professionals completing Colorado teaching licenses in science and mathematics; 3) increase the number of early STEM education experiences for students to encourage more to consider teaching science or mathematics as a career; 4) provide ongoing mentoring and professional development support for science and mathematics teachers during their induction year at high-need schools; and 5) assess, disseminate, and sustain the best recruitment and retention practices. By the end of the 5 year project, we propose to provide 22 Noyce Scholarships for highly qualified juniors and seniors in STEM majors who also complete the teacher preparation program; 8 Noyce Post-Bac Stipends for highly qualified STEM professionals who return to complete their teacher licenses in science or mathematics; 80 Noyce Internships for freshmen and sophomores for early STEM education experiences; at least 4 professional development seminars for each Noyce Teacher in the high-need schools; and mentors for each of the Noyce Teachers to support the induction phase. In the end, an additional 30 Noyce Teachers will start their teaching careers in high-need schools.

To implement the program, the University of Northern Colorado has partnered with 25 school districts, 19 of these are in rural communities where the need for science and mathematics teachers is very high. Most of the school districts also meet the high-need classification by having a high proportion of the students in poverty status (as measured by eligibility for free or reduced lunches). Each of these school districts is committed to collaborating with UNC during the early field experiences, student teaching, and consideration for employment of the Noyce Teachers.

In November 2010, we selected our first 3 Noyce Scholars and in April 2011 we selected an additional 6 Noyce Scholars and 2 Noyce Post-Bacs. We also have already selected the first 10 Noyce Interns. Two of the Noyce Scholars graduated in May 2011 and completed their teacher preparation program. They are both actively interviewing for full time teaching positions in high-need schools for Fall 2011. One of the Noyce Scholars has accepted a summer internship with Science Teacher and Researcher (STAR) Program.
The Iowa Noyce Scholars program is a value-added component of a major inter-university collaborative initiative to recruit, prepare, and retain exemplary secondary teachers of mathematics and science in Iowa. The umbrella program is called the Iowa Mathematics & Science Education Partnership (IMSEP), which was launched in fall of 2008. The Robert Noyce Scholars award was earned for the beginning of the academic year 2009-2010, thus year 2 is nearing completion. This poster spans the period of July, 2010 to present, March 31, 2010.

Thirteen undergraduate and graduate STEM majors were awarded Noyce Scholarships in 2009-2010, across three institutions in Iowa’s public university system: University of Iowa, Iowa State University, and University of Northern Iowa. A total of 10 scholarships were granted for academic year 2010-2011. Combined with the thirteen scholarships awarded in year 1 (2009-2010), a total of twenty-three $10,000 scholarships have been awarded to fifteen qualified candidates in the first two years of the Iowa Noyce Scholars program. Five Noyce Scholarship recipients have graduated or otherwise completed the program. Two are teaching in high-need schools, and three are in temporary positions seeking employment.

Evaluators are monitoring graduates for indicators that include the following for years 1 and 2: program quality, graduate quality, job performance quality. Over the last three years, the number of pre-service science teachers in the pipeline across the Iowa university system is up 22 percent, and for pre-service mathematics teachers the gain is 63 percent. Iowa Noyce scholars can be typified as having (a) higher GPAs on average than pre-service math/science pool; (b) presently low ethnic and racial diversity though high socioeconomic diversity. First year end-of-year interviews and artifact collections of Noyce Scholars now teaching are beginning, along with interviews of their principals.

The University of Puerto Rico in Rio Piedras (Faculty of Natural Sciences) is developing a Robert Noyce Master Teacher Fellowship initiative in collaboration with the Puerto Rico Department of Education (PRDE) to establish the first Puerto Rico Master Math Teacher Program (PRMMTP). This project will certify ten 7-12 grade mathematics teachers, who teach in high-need school districts, as Master Math Teachers (MMT) through the University of Puerto Rico Rio Piedras Campus' Division of Continuing Education. These MMTs are being trained to offer professional development to math teachers at the Professional Math and Science Resource Centers (PMSRC) that have been established throughout the Island by the Puerto Rico Math and Science Partnership (PRMSP).

The MMTs will serve as role models for exemplary mathematics teaching practices and content knowledge, and leaders among their peers to promote improvements in student academic achievement. All participants have completed or are in the process of completing a Master’s Degree, and have a professional track record of excellence in teaching. The PRMMTP consists of two phases. During phase one they will participate in an intensive certification program followed by a period where the MMTs serve as professional developers while they complete the five years of service required by this program. In the second phase the certified MMTs will assume leadership roles within high need school districts. Activities will include serving as mentors, participating in curriculum development projects, participating in pre-service teacher education, and assisting in the development and implementation of professional development for other teachers, particularly in the PMSRCs.

MMTs will also participate as Cooperating Teachers during the practicum of 7-12th grade pre-service math teachers, and...
as mentors for beginning teachers. To evaluate the impact of the PRMMTP, student achievement in mathematics attained by students of teachers in the Master Teachers’ project will be assessed through the standardized math tests which are administered in all schools by the PRDE. Also, NSF MMT Fellows will be paired with comparable students taught by teachers from comparable high-need schools using a matched-control group pre/post design. Results of these evaluation/research projects would be used to identify elements that enhance students’ academic achievement in math.

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Title: University of Rochester Noyce Scholars Program: Preparing Highly Qualified Mathematics and Science Teachers for High Needs Schools
NSF Noyce Award Number: 0733817
Principal Investigator: Raffaella Borasi
Email: rborasi@warner.rochester.edu
Institution: University of Rochester
Co-PI(s): Jeffrey Choppin, Michael E Gage, Jack Kampmeier, and April Luehmann
Presenter(s): Raffaella Borasi, University of Rochester, rborasi@warner.rochester.edu
Project Discipline: Education

In January 2008, the University of Rochester (UR) was awarded a Robert Noyce Scholarship grant to prepare 30 high -quality math and science teachers for high-need schools over a 3-year period through our 15-month graduate programs; in September 2008, we were also awarded a supplement to pilot additional post-graduation experiences for science UR Noyce Scholars.

To date, all thirty Noyce Scholarships have been assigned and recipients will have graduated and received teaching certificates by the Fall of 2011. Moreover UR has seen increases that have tripled applications and doubled enrollment in the mathematics and science teacher preparation programs over the last three years. In this poster we detail our successes in recruiting a strong and diverse group of future STEM teachers, in preparing highly qualified STEM teachers, and in placing those teachers in high -need schools. In addition, we report on the beginnings of efforts to support novice STEM teachers in their teaching.

Key lessons learned: The insights gained from the evaluation of the project, as well as the leadership team’s direct observations of program activities, suggest a number of potential program improvements such as strengthening further the mentoring component of the program and providing options for pursuing enhancements to certification in areas such as teaching students with disabilities.

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Title: Preparing Highly Qualified K-12 STEM Teacher Leaders for Urban Schools (2010 - 2015)
NSF Noyce Award Number: 1035283
Principal Investigator: Judi Fonzi
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Institution: University of Rochester
Co-PI(s): Raffaella Borasi, April Luehmann, and Carl Mueller
Presenter(s): Judi Fonzi, University of Rochester, Judith.Fonzi@rochester.edu
Project Discipline: K - 12 Mathematics and Science

This project is preparing a cohort of 24 K-12 STEM master teachers for the Rochester City School District, a high-needs district with the highest poverty rate in New York State. The goal is to build capacity to sustain high-quality math and science teaching. Fellows engaging in a combination of post-Master’s coursework and mentored practice to increase their knowledge and skills in STEM content, pedagogy, reform-based instructional materials and assessments, professional development, and leadership, to serve as models, professional development providers and instructional leaders for their district.

The scaffolded professional development (PD) program focuses first on their own practice as STEM teachers, and then each year addresses another dimension of their role as master teachers / leaders (i.e., serving as a mentor to individual in-service and pre-service STEM teachers, providing professional development through workshops and summer institutes for STEM teachers, and finally becoming a reform change agent promoting STEM innovations in the district) while also continuing to work on the previously established dimensions. Each year Fellows attend graduate level courses and undertake a series of mentored field experiences most pertinent to the focus for that year; these experiences are further integrated in a monthly Leadership Seminar. The core of the PD program is designed to serve the 24 K-12 mathematics and science teachers as a cohort rather than separating math and science or elementary and secondary. The goal is to build a critical mass of highly qualified educational leaders who have a deep understanding of how people learn, instructional practices that support learning, and of leadership, the process of change and systemic reform.

The core program is complemented with summer content-focused PD by capitalizing on a few high quality programs.
provided by leaders in their field (e.g., EDC, TERC, Lawrence Hall of Science, Cornell Institute for Biology Teachers) and opportunities to teach in informal settings (e.g., Rochester Museum and Science Center summer camps, Get Real! Science Camp, Horizon Summer Program for urban students. Each Fellow plans his/her unique summer program in consultation with project staff and mentors. Engaging in these experiences provides opportunities to widen Fellows’ personal network of high quality educators and to deepen content and pedagogical content knowledge.

The last two years of the program are designed to provide long-term sustainability by including Fellows in the district’s design and implementation of reform initiatives. In anticipation of the district roles Fellows may wish to take on as a result of this work, this program provides for a self-selected subset of Fellows to apply for and complete the additional requirements for state certification as a school/ district leader or an Ed.D. program.

139
Title: University of South Alabama ’Pathway to Science’
NSF Noyce Award Number: 0934829
Principal Investigator: Andre M. Green
Email: green@usouthal.edu
Institution: University of South Alabama
Co-PI(s): Justin Sanders, Phillip Feldman
Presenter(s): Andre M. Green, University of South Alabama, green@usouthal.edu
Project Discipline: Science
URL(s): www.usapathwaytoscience.com

Pathway to Science (PTS) is an innovative Phase One project involving the University of South Alabama College of Education, College of Arts and Sciences, and the Mobile County Public School System (MCPSS), the largest school district in Alabama and the 39th largest in the nation. All entities involved have a vested interest in increasing the number of certified secondary science teachers. The goals of PTS include:

- Prepare a total of up to 24 science teachers over a five year period (current average of 4 graduates per year) who are highly qualified to teach chemistry, physics, biology, or general science. In short, PTS seeks to double the size of the current education program and work toward creating a steady stream of future science education majors, which will in turn increase the number of science teachers.
- Enhance student achievement by providing certified science teachers in those classrooms that currently have no certified teachers.
- Create a replicable model that will provide ongoing mentoring and professional development for novice science teachers to increase the probability that they will be retained and become career teachers.

The PTS project will recruit science majors into graduate science education through a content rich alternative certification curriculum that will culminate in a master’s degree in secondary science education.

PTS aims to increase greatly the supply of qualified science teachers for the Mobile County Public School System, and other partner school districts in rural southwest Alabama. We will attract racially and ethnically diverse science majors, (who are traditionally underrepresented among science teachers and who would likely take other career paths), into the teaching field. PTS will have an immediate impact on the academic achievement of students in the target school districts. Currently, the lack of certified science teachers is a major cause of poor achievement and low expectations for high-risk students. This problem is greatly exacerbated in both rural and urban areas because schools in these locales are most likely to serve disadvantaged children and to have teachers who are teaching out of field. Through the Noyce scholarship program, the pool of candidates to become science educators will be greatly expanded as the availability of resources to enable candidates’ entry into the teaching profession is expanded.

140
Title: University of South Carolina Science and Mathematics Teacher Initiative (USC-SMTI): Noyce Program Beginnings
NSF Noyce Award Number: 1035379
Principal Investigator: Jan A. Yow
Email: jyow@sc.edu
Institution: University of South Carolina
Co-PI(s): Bert Ely, Ed Dickey, Christine Lotter, Gerry Lopez-de-Victoria
Presenter(s): Jan A. Yow, University of South Carolina, jyow@sc.edu
URL(s): http://www.ed.sc.edu/ite/noyce.asp

The University of South Carolina Science and Mathematics Teacher Initiative (USC-SMTI), is in its first year of the Noyce Teacher Scholarship Program. Hence, we are largely in the recruiting and marketing phase of the grant. The three main components of the grant, in its current stage, include: (1) an
elective course for students wanting to serve in local high need math and science classrooms alongside mentor teachers to investigate if teaching is a career of interest for them, (2) similarly, a summer experience opportunity for students to work with secondary mentor math and science teachers and students to “try out” teaching, and (3) the 3-year Noyce scholarship for students in their junior, senior, and Masters of Teaching year who decide to pursue a teaching career in high school math and science classrooms in high need districts. Research components of the grant include investigations into the teacher leadership development of both the scholars and the mentor teachers through their involvement in the USC-SMTI Noyce Program.

141
Title: USF Robert Noyce STEM Scholar Program
NSF Noyce Award Number: 1035273
Principal Investigator: Gladis Kersaint
Email: kersaint@usf.edu
Institution: University of South Florida
Co-PI(s): Allan Feldman, Mile Krajcevski, and Jeff Ryan
Presenter(s): Gladis Kersaint, University of South Florida
Project Discipline: Mathematics / Science (Biology, Chemistry, Physics, Earth/Space Science)

The University of South Florida (USF) Robert Noyce Science, Technology, Engineering, and Mathematics (STEM) Scholars program will provide $30,000 stipends to 31 graduating seniors, recent graduates, and career changers who are interested in earning their teaching credentials in mathematics or science (Biology, Chemistry, Physics, & Earth/Space Science) by enrolling in a one-year accelerated Masters of Arts in Teaching (MAT) program as a full time student. The stipend is intended to cover the cost of attendance (i.e., tuition and fees) and other expenses. In return for this stipend, Robert Noyce STEM Scholars will commit to teach for at least two years in one of the following Tampa Bay area school districts: Hernando, Highlands, Hillsborough, Manatee, Pasco, Pinellas, Polk, or Sarasota.

Goal 1: Improve teacher recruitment. This is an ongoing goal of the Math for America project. Interviews of accepted Teaching Fellows indicates that the support provided by the program and prestige of participating institutions of higher education were factors that led them to apply for the Math for America Teaching Fellowship.

Goal 2: Improve teacher quality. We expect that these teachers will continue to grow in their teaching practice through mentoring and professional development activities provided by Math for America Los Angeles. Specific measurable outcomes that are being considered by our external evaluator include student (those of our Fellows) achievement data on state and district assessments, Fellows self-assessments of teaching practice, evaluator observations of Fellows’ teaching practices.

Goal 3: Improve teacher retention. We expect that these teachers will persist longer in the teaching profession than peers in their schools and districts. Only a long-term study of our Fellows will reveal whether the programs provided by Math for America Los Angeles have helped these Teaching Fellows to persist longer relative to their peers.

142
Title: Math for America Los Angeles: Improving Student Achievement by Focusing on Teacher Quality, Preparation and Professional Development
NSF Noyce Award Number: 0934923
Principal Investigator: Karen Symms Gallagher
Email: rspeedean@usc.edu
Institution: University of Southern California Rossier School of Education / Math for America Los Angeles

Co-PI(s): Darryl Yong and David Drew
Presenter(s): Pam Mason, USC Math for America Los Angeles, pam@mathforamerica.org
Project Discipline: Mathematics
URL(s): www.mathforamerica.org/la

The overall purpose of the project is to improve secondary school math teacher quality, recruitment and retention in the greater Los Angeles area. At present, the grant supports 10 Teaching Fellows, who are currently either in their first or second year of teaching service. All 10 fellows completed their credentialing and masters’ degree programs last year. Math for America Los Angeles provides its Teaching Fellows with financial, professional and emotional support and situates them in a community with other beginning and experienced teachers.

143
Title: Development of a Mathematics Teacher Community for Grades 6-20
NSF Noyce Award Number: 0833291
Principal Investigator: James Ford
Email: jford@usm.maine.edu
Institution: University of Southern Maine
Co-PI(s): Kelly McCormick, Robert Kuech, and Robert Sanford
Presenter(s): Amy Johnson, University of Southern Maine, amyj@usm.maine.edu
Since its beginning in October 2009, through the current academic year, the Robert Noyce Teacher Scholars project at USM has supported 31 students; awards are planned for eight new and four returning students in 2011-12.

In the fall of 2009, the USM project established the framework for a network of area mathematics teachers. The Southern Maine Mathematics Teacher Network (SMMTN) is a group of USM faculty, USM pre-service mathematics teachers, and middle and high school teachers from area schools that serve as clinical placement sites for USM interns.

At SMMTN’s four annual meetings, participating teachers engage in discussions and activities exploring key concepts in secondary mathematics. Teachers enjoy the chance to “talk math” and pedagogy with their peers at all points of the teacher continuum, and pre-service students (most notably, Noyce scholars) appreciate the opportunity to connect with their future colleagues.

In 2011-12, SMMTN will engage in a year-long strand of discussions around college readiness in mathematics: what are the fundamental concepts that high school students must master for success in college, especially in STEM programs of study? Where are these concepts embedded in the Common Core standards? What changes need to be made in the K-12 pipeline and at the transition to college to improve students’ readiness? USM faculty from the sciences, engineering, technology, and computer science will join in some of these conversations to identify math concepts where beginning STEM students struggle the most. Conversations will involve a mix of deep content exploration, pedagogical practices, and strategic planning.
The poster will feature details of our Marketing and Recruitment, Candidate Selection, Program Details, Successes and Challenges, Program Evaluation. Marketing and Recruitment efforts have included the development and maintenance of a website, development of flyers and other print materials, participation in recruitment fairs, visits to college campuses, and the use of personal contacts. Candidate Selection has been modeled after the selection process used in other urban residency programs, and includes a day-long group interview process. Components of the day, include a problem-solving discussion session, a teaching opportunity with students, a written response, and one-on-one interviews. Teams of raters collaborate on the final selection of candidates who must then be admitted to the university. Program Details will include information about the curriculum and the sequencing of courses. The program is designed to meet teacher licensure standards of a secondary teaching credential in Tennessee while adhering to the principles and elements of teaching, found in the urban residency model of teacher preparation. Successes and Challenges will cover the achievements and highlights of the past year, such as student-action research projects, and completion of the Teacher Performance Assessment process. It will also include challenges, such as candidate qualifications and state requirements, and mentor assignments. Program Evaluation will include information about the program evaluation design, which includes a series of site visits and interviews by our external reviewers. It will also cover some process steps that have been taken in response to evaluation findings.

146
Title: Evaluating Strategies of Recruitment, Preparation and Induction of Mathematics, Chemistry and Physics Teacher Candidates in the NSF Noyce Program I
NSF Noyce Award Number: 0833343
Principal Investigator: Ann Cavallo
Email: cavallo@uta.edu
Institution: University of Texas at Arlington
Co-PI(s): Greg Hale, James Epperson, Ramon Lopez
Presenter(s): Ann Cavallo, University of Texas at Arlington, cavallo@uta.edu
Gregory Hale, University of Texas at Arlington, greg@hale.uta.edu
James Epperson, University of Texas at Arlington, epperson@uta.edu
Ramon Lopez, University of Texas at Arlington, relopez@uta.edu
Project Discipline: Secondary School Chemistry, Physics, and Mathematics
URL(s): http://www.uta.edu/cos/noyce/

The Robert Noyce Scholarship Program (I) for Science and Mathematics Teachers program is designed to certify new teachers who are qualified to teach in the Dallas, Arlington, and Fort Worth Independent School Districts. Our program is a collaborative effort among the University of Texas-Arlington’s (UTA) College of Education and Health Professions and College of Science and these surrounding urban school districts. Together, our leadership team provides a program of campus courses, online courses, and classroom teaching experiences to certify 37 new mathematics and science teachers for the three school districts.

Our program objectives are to: 1) recruit mathematics and science teacher candidates from baccalaureate programs and career changers from local industry, 2) provide a quality two-track teacher certification program for our candidates, and 3) induct, monitor, and mentor our teacher candidates through the program and their early years of teaching. This project also actively recruits teacher candidates from underrepresented groups, and those in science and mathematics areas where there is greatest teaching need, specifically the physical sciences and higher-level mathematics. Since fall 2009, the program has successfully recruited 12 candidates primarily from underrepresented groups in science to pursue physics, chemistry or mathematics teacher certification. The program has also placed 24 students in summer internships with our community partners. Detailed demographic and evaluative information will be presented.

147
Title: Expanding the Effort: Recruitment, Preparation and Induction of Middle Level Science and Math, and Secondary Earth and Life Science Teacher Candidates in the NSF Noyce Program II
NSF Noyce Award Number: 0944551
Principal Investigator: Ann Cavallo
Email: cavallo@uta.edu
Institution: University of Texas at Arlington
Co-PI(s): Gregory Hale, Laura Mydlarz, Theresa Jorgensen, Laura Gough, Ramon Lopez
Presenter(s): Ann Cavallo, University of Texas at Arlington, cavallo@uta.edu
Gregory Hale, University of Texas at Arlington, greg@hale.uta.edu
Laura Mydlarz, University of Texas at Arlington, mydlarz@uta.edu
Theresa Jorgensen, University of Texas at Arlington,
The Robert Noyce Scholarship Program for Science and Mathematics Teachers program (II) is designed to certify new teachers who are qualified to teach in the Dallas, Arlington, Fort Worth and Hurst-Euless Bedford Independent School Districts. Our program is a collaborative effort among the University of Texas at Arlington’s (UTA) College of Education and Health Professions, College of Science, Tarrant County College, and these four surrounding urban school districts. Together, our leadership team provides a program of campus courses, online mentoring, and classroom teaching experiences to certify 54 new science and mathematics teachers for the four school districts. Our program objectives are to: 1) recruit mathematics and science teacher candidates from baccalaureate programs, community colleges, and career changers from local industry, 2) provide a quality two-track teacher certification program for our candidates, and 3) induct, monitor, and mentor our teacher candidates through the program and their early years of teaching. Our Robert Noyce Scholarship Program I specifically recruits teacher candidates in secondary school chemistry, physics, and mathematics.

This new Noyce Program II complements these efforts by focusing on recruiting teacher candidates in secondary earth science, life science, and middle-level (grades 4-8) science and mathematics. Our recruitment efforts for Noyce Scholars have been enhanced by a comprehensive STEM teacher candidate recruiting program already in place in our new UTeach replication grant. Among the 20 universities nationally that have adopted the UTeach model, the program has proven to markedly increase candidate recruitment and retention in teaching. Our Robert Noyce Scholarship program expands efforts in recruiting and maintaining the influx of new STEM teacher candidates in the UTeach Arlington program from our student population, community colleges, and the local area. To date, our Noyce program has received over 55 applications for summer internships from among our College of Science and College of Engineering students. Information on our program and recruitment efforts will be presented.

The UTeach Observation Protocol (UTOP) is a classroom observation instrument that was designed to evaluate the teaching of Noyce Scholar graduates from the UTeach program at the University of Texas at Austin. The UTOP assesses several dimensions of teaching practice, including classroom environment, lesson structure, implementation, and math/science content knowledge as a mediator of instruction. An initial observational study of 36 teachers showed that Noyce Scholars scored significantly higher on the UTOP (p < .01) than other graduates from the UTeach program and than teachers from other preparation backgrounds. In partnership with the Measures of Effective Teaching project, two further video observation studies (N=235 and N=994) were conducted to develop, refine, and validate the UTOP. These studies sought to determine how characteristics of effective teaching, particularly relating to math/science content knowledge, can be reliably identified by trained observers. Results showed that three of the four components of quality teaching that the UTOP measures are rarely seen in the general teacher population. These findings will continue to inform our efforts to evaluate Noyce Scholars.

Title: Building Excellence in STEM Teaching
NSF Noyce Award Number: 0934896
Principal Investigator: Jerzy Mogilski
Email: jerzy.mogilski@utb.edu
Institution: University of Texas at Brownsville and Texas South
Co-PI(s): Ray Ramirez, Sanjay Kumar, Eli Pena, Carmen Cardenas, Betsy Price
Presenter(s): Lupita Armendariz, UTB/TSC, lupita.armendariz@utb.edu
Project Discipline: Mathematics and Science
URL(s): http://www.utb.edu/vpia/Pages/NoyceProgram.aspx
The University of Texas at Brownsville has significant recruitment highlights to report. We participated in the All Majors and Teachers Career Fair in FY 2009, 2010, and 2011. The Program Director presented recruitment information and literature to both the Dean and Department Chair in the College of Education and the College of Science, Mathematics, and Technology (CMST). Our close working relationship with the CMST resulted in enhancing our presence on their website. We also interact regularly with the university’s Academic Advisors and Financial Aid Officers. In addition, the Program Director meets with student members of The Society of Mexican American Engineers and Scientist (MAES) and the Society of Hispanic Professional Engineers (SHPE). MAES is one of our external partners. Efforts to recruit Career Changers for the scholarship, included Power Point presentations to the Harlingen Manufactures Association, the Delta Kappa Gamma the MAES National Symposium, and at the Hispanic Engineer National Achievement Awards Conference (HENAAC).

With additional funding from the UTB Scorpion Fund, which supports student travel to professional organizations, twenty-five MAES and SHPE student members attended the national symposia and conferences, and HENAAC with the Director. This was the first time that the students had traveled out of state to attend a national conference. In November 2009, four female MAES officers competed in the College Bowl and tied for 3rd Place. This was a significant accomplishment, because this was their first conference and first time traveling out of state.

As a result of the Summer Institute’s activities to provide a wide variety of teaching experiences and engagement with our community partners, participants in the Summer Institute volunteered after school and weekends at the Children’s Museum of Brownsville and at the Gladys Porter Zoo, beyond their obligation for the grant. Summer participants also assisted the Transition to Teaching Professionals in a week-long Summer Camp Program at St Mary’s Elementary School. This program is sponsored by the University’s Alternative Pathway Certification.

Three career changers have completed the certification program and are teaching in area schools. This fall, we anticipate four new career changers. We are ahead of schedule with career changers, and expect to have more in the school systems than originally proposed! We have three current Scholars, with twelve starting in the Fall of 2011.

The following materials will be shown on the Poster:

- Other printed materials that highlight our diverse activities
- Pictures from last year’s Summer Institute Field Trips and Summer Camp at St Mary’s Elementary School

150
Title: Robert Noyce Scholarships for Teaching Miners: A Continuous Support Model
NSF Noyce Award Number: 1035502
Principal Investigator: Eric A. Hagedorn
Email: ehagedorn@utep.edu
Institution: University of Texas at El Paso
Co-PI(s): Olga Kosheleva, Laura Serpa, Amy Wagler, and Ron Wagler
Presenter(s): Eric A. Hagedorn, University of Texas at El Paso, ehagedorn@utep.edu
Fernando Villa, University of Texas at El Paso, fvilla@miners.utep.edu
Project Discipline: Physics, Mathematics, Geosciences, Biology, Chemistry, Teacher Education
URL(s): www.utep.edu/noyce

We describe our Noyce based science/mathematics teacher preparation model, as one of 'continuous support.' The financial support is a given, but for juniors and seniors at UTEP, our model includes curricular support in the form of academic year workshops emphasizing: 1) inquiry-based teaching approaches, 2) interdisciplinary (mathematics & science) integration, and 3) actual inquiry in the form of a senior research project. These workshops are developed and facilitated by a team of university faculty (physics, geoscience, mathematics, and teacher education) and school district partners (science and mathematics teacher mentors/coaches). These district partners will work with our Noyce Scholars when they are placed in either classroom observation or student teacher sites.

Once our Noyce Scholars graduate, our model includes unique induction year support: placing 2 or 3 Noyce Scholars in the same school. This placement with classmates is inherently supportive, but when combined with the mentoring of district personnel with whom the Noyce Scholars became familiar over two years of teacher preparation, should be uniquely effective. This poster will also provide an overview of participant responses to open-ended questionnaires and focus group questions, from our first year. During this first year (Spring 2011), we supported 6 Scholars. The academic year 2011-2012 will be the first year with a full cohort of 12 new Scholars.
151
Title: The University of Texas at Tyler Noyce Scholars Program
NSF Noyce Award Number: 1035462
Principal Investigator: Bambi Bailey
Email: bbailey@uttyler.edu
Institution: University of Texas at Tyler
Co-PI(s): Fredericka Brown and Michael Odell
Presenter(s): Bambi Bailey, Fredericka Brown, and Michael Odell
Project Discipline: STEM Education - Biology, Chemistry, Mathematics

The University of Texas at Tyler is a comprehensive institution of higher education in East Texas, offering undergraduate and graduate degree programs, as an institution in The University of Texas System. UTeach is a dual program offered jointly by the College of Arts and Sciences and the College of Education and Psychology. The goal of the UTeach program at UT Tyler is to provide Mathematics, Biology or Chemistry majors an opportunity to broaden their career options, without deterring them from obtaining a mathematics or science undergraduate degree. The UTeach program is structured so that students may graduate in four years, with both an undergraduate degree in mathematics or science and a secondary (8-12) teaching certificate.

Students from the University or Tyler Junior College can give the UTeach program a try at no cost. Step 1 and 2 courses, which allow students to teach lessons in public school classrooms, are free, as long as the student successfully completes each course with a passing grade. Students in the program receive mentoring and support from experienced professionals. Finally, students have opportunities for scholarships and paid internships through programs like the Noyce Teaching Scholarship Program.

The budding Noyce Scholars Program at UT Tyler includes two major components, the Noyce internships and Noyce scholarships. Freshmen and sophomore STEM majors may apply for a position as a Noyce intern during the summer, where they will work with professional development programs for teachers, mathematics and science related summer camps and local informal science venues to provide programming. The Noyce internships act as a recruitment tool to encourage STEM majors to consider teaching through the UTeach program. Juniors and seniors who have chosen to commit to the UTeach program, may apply for the Noyce scholarships.

Due to the unique relationship between UT Tyler and Tyler Junior College, students learn about the UTeach program and the Noyce internships and scholarships at each institution in their Calculus I and Step 1 and 2 classes so that students may make a smooth transition to STEM education should they make that choice. In addition, advisors in STEM fields and education remind students about Noyce opportunities.

152
Title: UTPB Noyce Scholars: Promoting STEM Teaching
NSF Noyce Award Number: 0833283
Principal Investigator: Roy Hurst
Email: hurst_r@utpb.edu
Institution: University of Texas of the Permian Basin
Co-PI(s): Doug Hale
Presenter(s): Roy Hurst, University of Texas of the Permian Basin, hurst_r@utpb.edu
Project Discipline: Science and Mathematics

The University of Texas of the Permian Basin's (UTPB) Noyce Scholars Program is recruiting, preparing, and inducting highly qualified science and mathematics teachers to meet the critical need of our partner school districts in southwest Texas. The UTPB Noyce Scholars program recruits teacher candidates from undergraduate majors, as well as career changers and recent university graduates, with the desire and potential to teach.

UTPB serves a geographically remote area of west Texas, and females and Hispanics comprise more than 65% of the student body. By reducing financial barriers and providing supportive structures, the project is facilitating the success and retention of STEM teachers.

The first cohort of Scholars were accepted in fall 2009, resulting in 12 total Scholars to date. Candidate demographics are: 9 undergraduates and 3 post-baccalaureates; 12 female; 7 Hispanic/Latino and 5 Caucasian. Three Scholars are teaching in high-need districts. The uncertain state of school funding in Texas is hampering the efforts of other candidates to begin teaching because nearly all school districts currently have a 'hard freeze' on hiring new teachers. This represents a challenge for the program to address going forward.
153
Title: Supporting UT3 Noyce Scholars and Educators
NSF Noyce Award Number: 0733767
Principal Investigator: Charlene M. Czerniak
Email: cczerni@utnet.utoledo.edu
Institution: University of Toledo
Co-PI(s): Brian Ashburner
Presenters: Charlene M. Czerniak, Elizabeth McKnight, Brian Ashburner
Project Discipline: Science and Mathematics
URL(s): http://www.teachut3.utoledo.edu/noyce/index.aspx

The UT3 Noyce Scholarship Program is a four-year program that began in 2008. The goal is to recruit 40 STEM professionals to meet the anticipated need for math and science teachers in Ohio's high-need school districts. Each UT3 Noyce Scholarship recipient received a stipend to assist with tuition and living expenses. Most were career changers. The stipend support allowed them to enroll in graduate level coursework, which made them eligible, after two semesters, for an Ohio Alternative Educator License.

Ohio’s Alternative License is a fast-track program that fills math and science classrooms with highly qualified teachers. The Alternative License will become a full license once the teacher meets the qualifications set forth by the State. The UT3 Noyce Scholarship not only paid for the additional coursework needed towards the Alternative licensure, but gave our career-changers a living allowance, which made their career change possible.

Although the Alternative Licensure is still an option for Ohio graduates, our local school districts now require teachers to have full licensure to substitute in their schools, as well as an eligibility requirement to hire them. With the downturn in the economy, budget cuts by local school districts, and the result of school districts changing hiring policies this past year, we have now turned our focus to a full licensure program where students receive a Master’s degree in education.

The UT3 Noyce Scholarship now supports students with a Baccalaureate degree in a science or math field who have been accepted into our one-year licensure and Master’s degree program. The Licensure Alternative Master’s Program (LAMP) cohort gives career changers the opportunity to become licensed and obtain a Master’s degree in a considerably shorter time period than conventional programs. The UT3 Noyce Scholarship will pay for the program as well as provide participants a stipend for books and living expenses.

There is a selection process for both the UT3 Noyce Scholarship and LAMP participants. Students must pass the Praxis II content test in their area of licensure prior to being accepted into LAMP and in conjunction with acceptance into the University of Toledo’s College of Graduate Studies. It is during the interview process, for the UT3 Noyce Scholarship, that potential recipients share their desire to teach in high-need schools. In the fall, at the start of the LAMP program, Noyce Scholars are placed in a high-need school for a full year and remain in the classroom with the same master mentor teachers. Working with area districts to place LAMP students, with seasoned mentor teachers, insures that Noyce Scholars will have an excellent foundation for success. The LAMP program will allow our students the flexibility to teach in any high-need school district in the U.S., which will provide better options for securing employment.

The UT3 Noyce Scholarship continues to provide induction support to our 28 previous UT3 Noyce Scholars through our Cultivating Urban Teachers Seminars. Our plan is to have all scholars come together this summer and share experiences and information with each other.

154
Title: MfA Utah’s SMART Program: Mentoring Fellows for Long-Term Success
NSF Noyce Award Number: 0934894
Principal Investigator: Hugo Rossi
Email: rossi@math.utah.edu
Institution: University of Utah, Utah State University
Co-PI(s): Eric Rowley and Mary Burbank
Presenter(s): Holly Godsey, University of Utah, holly.godsey@utah.edu
Project Discipline: Mathematics
URL(s): http://www.csme.utah.edu/programs/smart/index.html

SMART (Support and Mentoring for an Alternative Route to Teaching) is a partnership between the University of Utah, Utah State University, Math for America, and the Robert Noyce Teacher Scholarship program. The goal of the program is to recruit and support professionals with strong mathematical backgrounds while they transition into the teaching profession and work toward becoming master teachers. The program is founded on the principles that 1) content knowledge and pedagogical skills must be integrated during teacher preparation, and 2) developing teachers will benefit from a multifaceted support network that includes joint coursework, professional development activities, regular cohort meetings and, notably, long-term mentoring by a master teacher.
SMART is currently composed of 23 Fellows and 18 mentors in three cohorts. For the first four semesters of SMART, fellows are required to take a full course of study consisting of both pedagogy and content courses, culminating with a provisional teaching license. Fellows also participate in a professional learning community via monthly cohort meetings with peers, mentors, school district and university professionals. Each fellow is paired with a mentor, who advises them on lesson plan development, classroom management strategies, and other professional skills throughout their student teaching phase. In subsequent years, fellows teach full-time in a secondary school and continue to take courses toward the completion of a MS degree in Mathematics Teaching. The mentor-fellow relationship is maintained, albeit in a less formal manner, as both fellows and mentors continue to meet monthly and attend cohort meetings. Toward the end of their tenure in the SMART program, fellows will become leaders in their respective teaching communities and will work with their mentors to obtain National Board Certification.

The most notable accomplishment of SMART to date is the effectiveness of the fellow-mentor relationship for developing a highly reflective teaching practice. Evidence for this comes, in part, from our interim external evaluation findings: Interactions with their mentors have provided fellows with invaluable insights into effective mathematics instruction. This relationship, along with the coursework and peer collaboration that occurs in cohort meetings, appears to be a great strength of the SMART program. Also, University faculty members involved with teacher preparation have noted that this is the most reflective group of pre-service teachers that they have worked with. The level of introspection of the SMART fellows is perhaps most evident in final projects that were presented at a year-end poster session. Several fellows indicated that their own teaching practice has been significantly improved by their mentors’ help in identifying problems and support while they worked through solutions.

**155**

**Title:** The University of Vermont Robert Noyce Scholarship Program: The Challenge of Recruitment and Retention in Science Education

**NSF Noyce Award Number:** 0934714

**Principal Investigator:** Regina Toolin

**Email:** Rtoolin@uvm.edu

**Institution:** University of Vermont

**Co-PI(s):** Lesley-Ann Dupigny-Giroux and Rory Waterman

**Presenter(s):** Regina Toolin, University of Vermont, Rtoolin@uvm.edu

**URL(s):** [http://www.uvm.edu/~noyce/](http://www.uvm.edu/~noyce/)

The University of Vermont’s (UVM) Robert Noyce Scholarship Program will award 12 undergraduate scholarships (three 2-year scholarships each year over a 4-year period) and 15 graduate stipends (three 1-year stipends each year over a 5-year period) through a competitive process to STEM majors enrolled in science teacher education in the College of Education and Social Services. In addition, the program will award 40 undergraduates (8 undergraduate students per year over a 5-year period) a stipend for their participation in a 10 week summer research internship.

The UVM Robert Noyce Scholarship program is designed to attract, prepare and retain secondary school teachers with strong content and pedagogical expertise in the natural and environmental sciences. At the core of the Secondary Science Program is the idea that science teachers must critically reflect upon questions about science and science teaching as it relates to society and schools. The Noyce Program will be delivered through a collaborative partnership between UVM’s highly effective and nationally recognized College of Education and Social Services and College of Arts and Sciences and Burlington and Milton High Schools and will lead to strategies of recruitment in science education as well as in retention of undergraduate and graduate science students. This presentation will highlight some of the strategies that have been implemented in the marketing and recruitment phases of the program.
This poster showcases a successful approach to the recruitment and preparation of STEM teachers - the Alternative Careers in Teaching program (Act!). Act! is a partnership between six institutions of higher education in Northeast Wisconsin. The goal of Act! is to increase the number of licensed, highly qualified math and science teachers. Act! recruits non-traditional adults with a Bachelor’s degree or higher to transition from careers as practicing mathematicians and scientists to careers as professional educators. More than 80 individuals have enrolled in Act! since it began in 2006; and more than 500 have inquired about this alternative pathway to becoming a teacher of math or science. Our poster includes information on this multi-institution program, the customization of our curriculum for non-traditional adult learners, demographic information about applicants accepted into Act!, recruitment and marketing issues, information on the employment of program completers, and testimonial statements from current and former Act! students.

157
Title: First Year Noyce Program at Vassar College
NSF Noyce Award Number: 1035409
Principal Investigator: Charles Steinhorn
Email: steinhorn@vassar.edu
Institution: Vassar College
Co-PI(s): Cindy Schwarz, Chris Bjork, and Bill Strauss
Presenter(s): Cindy Schwarz and Chris Bjork, Vassar College

We describe the progress we have made in the first year of the grant, including establishing our group of STEM mentors, working with the Office of Fellowships to advertise the grant opportunities for the summer internships and scholar programs, and selecting our first recipients (4 summer internships and two scholars). We also began planning next year’s activities for the scholars, working with the local high school science teacher who serves as the Noyce Coordinator with the area schools.

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Title: Supporting Noyce Scholars in High Need Classrooms: Recruiting and Training Effective Noyce Teacher Fellows
NSF Noyce Award Number: 0934552
Principal Investigator: Jacqueline T. McDonnough
Email: jtmcdonnough@vcu.edu
Institution: Virginia Commonwealth University
Co-PI(s): Alison Baski and Sally Hunnicutt
Presenter(s): Jacqueline T. McDonnough, Virginia Commonwealth University, jtmcdonnough@vcu.edu
Project Discipline: Science Education; Biology, Chemistry, Physics, Earth Science
URL(s): http://www.soe.vcu.edu/departments/tl/noyce.html

The Virginia Commonwealth University (VCU) Noyce Initiative has completed its second year in operation and has graduated five Noyce Scholars. Three of these secondary science teachers have been offered contracts in high need school districts. One of the goals of the VCU Noyce Initiative is to increase and retain the number of highly qualified secondary science teachers in high need schools. Research indicates that teacher retention is dependent on preservice teachers’ field experiences and mentoring in their first years of teaching. The VCU Noyce Initiative has focused on providing field experiences in high need schools to better acclimate the Scholars to those environments and cultures. This report will highlight the training provided to secondary science teachers in high need schools who serve as cooperating teacher to Noyce Scholars.

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Title: The Noyce Experience: A Comparative Analysis of Exit Interviews
NSF Noyce Award Number: 0832992
Principal Investigator: Anderson Norton
Email: norton3@vt.edu
Institution: Virginia Tech
Co-PI(s): Jesse L. M. Wilkins
Presenter(s): Steven Boyce & Anderson Norton, Virginia Tech, norton3@vt.edu
Project Discipline: Secondary Math
URL(s): www.mathed.soe.vt.edu

Analysis of survey results from student teachers in the Virginia Tech Mathematics Education Program and interviews with Noyce Scholars reveal differences in pre-service teacher’s perceptions of their preparation. Both Noyce Scholars and other student teachers completed an online evaluation of the Mathematics Education Program based on the California State University Systemwide Evaluation of Professional Teacher Preparation Survey. Thirty-minute semi-structured interviews were conducted with five Noyce Scholars in order to ascertain their perception of the value of Noyce-funded Virginia Teach initiatives and to follow up with their survey responses.

Notably, the data indicate that the Noyce Scholars have developed a strong sense of a community of support, and this sense of community may be associated with a disposition for more collaborative teaching in future practice. The data also indicate that Noyce Scholars are more aware of the challenges of implementing strategies in high-needs schools,
and they feel that varied field experiences are paramount in increasing preparedness for teaching in high-needs schools. Noyce Scholars had a generally high level of satisfaction with both the Virginia Tech Mathematics Education Program and Virginia Teach. Suggestions for improvements include additional focus on preparation for urban rather than rural teaching, emphasis on implementation rather than theoretical ideas, and monthly Scholar meetings to discuss literature pertaining to high-needs schools.

At this time, 7 of the 16 Scholars have fully completed the program and are employed in high need schools. One of these students was named the “Outstanding Mathematics Graduate for 2007-08” and another has put his engineering background to good use, developing Career & Technical Education applied mathematics courses in his new teaching position. An eighth student has elected not to complete his student teaching due to family circumstances. Two others are currently student teaching and the remaining four students will student teach within the next two semesters.

All students have indicated that the Noyce Program has been powerful for them. As math majors, they noted that they do a great deal of analytical mathematics, but one student’s comment was representative of the group’s experience, “Taking an engineering minor provided me with tremendous examples of applications of mathematics and really helped me see how to show my students how math is applied in the real world.” Graduates share a high level of confidence regarding their preparation and their ability to make math relevant to all students, and cumulatively hold a 3.45 grade point average.

The goal of the Noyce TEACH-WV program is to recruit 20 West Virginia University (WVU) STEM majors to complete the Benedum Collaborative Five-year teacher education program. These Scholarship recipients will earn a physics, chemistry, biology or math bachelor's degree, as well as a master's degree in education. Upon completing the program, they will be certified to teach science or math in grades 5-12. The students will receive 3-year scholarships of $10,000 per year ($30,000 total) for their junior, senior and masters years. In return, they will teach for six years in high need schools in West Virginia, as defined by NSF. As of fall 2009, all schools in WV meet the criteria.
This year, the program was expanded to include students in the Post-Baccalaureate Program in Secondary Science Education in order to expand the potential pool of applicants in science, especially chemistry and physics. This is a two-year program, and the students will receive two years of funding and complete a four-year teaching commitment. One potential strategy to engage students in STEM fields is to teach science content in the context of societal issues. This approach is intended to show students the relevance of science, technology, engineering and math to their personal lives, their future careers and their communities, thus enhancing the appeal of science and math to a diverse group of students.

These aims are being implemented in a mentoring project during which Scholars complete an undergraduate course, teaching placement, followed by an action-research type project, which is supervised by faculty in education and in the science and math departments. It is anticipated that this will also enhance the vertical alignment between K-12 and college STEM teaching.

In order to best utilize faculty expertise, we have broadened the potential pedagogical strategies to include interdisciplinary teaching, enhancement of active learning, and other best practices. Our first two graduating Scholars (May 2011), engaged in the action-research portion of the project in spring semester 2011, collected survey data from WVU professors, WVU students, and high school faculty in math and chemistry. They asked each group to identify areas in which students are underperforming and to compare/contrast the responses among the groups. Future Scholars will use these results to develop specific recommendations and course materials, to address these areas at the high school and college levels using strategies related to societal relevance, interdisciplinarity, active learning, etc.

Western Kentucky University’s Noyce Program seeks to increase the number of highly qualified STEM educators in high-needs areas by increasing the numbers of mathematics and science majors who choose teaching as a career. Our program plans to support 39 new teachers during the duration of our project. The $10,000 financial incentive is available for qualified juniors and seniors. WKU’s Noyce Program enhances the current SKyTeach program by including cyber-mentoring, cyber-networking, and sneak-peeks into professionalism by providing memberships to national mathematics and science teacher organizations and by funding travel to national meetings. Retention efforts will build on relationships and professional learning communities established while at WKU, and will provide formal and informal opportunities for post-graduation mentoring by continuing the cyber component and holding meetings at professional conferences.

During the 2010-2011 academic year, new recruiting strategies were implemented based on lessons learned during the first year. Our first cohort of Noyce Scholars started in August 2010, and they have been given opportunities to enhance their education by developing professional learning communities and by focusing on what professionalism means. Our Noyce Scholars have attended and presented at state, regional, and national meetings. They also participated in on-campus seminars which were designed to address topics that are important in the field of education. Topics for this past year’s seminars addressed professionalism, literacy in the math and science classroom, technology in STEM classrooms, new teacher panels, and more. Initial reaction to this year’s activities has been positive, and plans to improve and expand the focus on professionalism to all SKyTeach students are under way.

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Title: Western Kentucky University’s Noyce Program
NSF Noyce Award Number: 0934804
Principal Investigator: Hope Marchionda
Email: hope.marchionda@wku.edu
Institution: Western Kentucky University
Co-PI(s): Kerrie McDaniel, Janet Tassell, and Martha Day
Presenter(s): Hope Marchionda, Western Kentucky University, hope.marchionda@wku.edu
Project Discipline: Biology, Chemistry, Earth & Space Science, Mathematics, and Physics
URL(s): http://www.wku.edu/noyce/

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Title: TeachWashington Noyce Teacher Scholarships and Summer Internships
NSF Noyce Award Number: 0934785
Principal Investigator: Bruce E. Larson
Email: blarson@wwu.edu
Institution: Western Washington University
Co-PI(s): George 'Pinky' Nelson
Presenter(s): Bruce E. Larson, Western Washington University, Bruce.Larson@wwu.edu
Project Discipline: Science, Mathematics, Secondary Education
URL(s): http://www.wce.wwu.edu/Resources/Scholarships/Noyce/
The goal of the TeachWashington Noyce Teacher Scholarships Program is to contribute to a larger vision to permanently increase the number of secondary mathematics and science teachers prepared at Western Washington University (WWU), without sacrificing the proven quality of our graduates. We will award seventy-five Noyce Scholarships to recruit forty additional STEM majors in their junior and senior year, and/or STEM graduates or professionals, who are making a career change to become mathematics or science teachers.

To build demand for the scholarships, we will focus on three activities: 1) Prepare and support 85 STEM students over five years to receive summer internships teaching mathematics and science at two local school districts. After completing a summer internship, students will be eligible to apply for Noyce Teacher Scholarships should they decide to pursue a teaching certificate; 2) Recruit junior and senior STEM undergraduates. On campus, we will initiate aggressive recruitment and clear advising of current STEM majors who have not declared a teaching interest. We will work with local community colleges to recruit graduates pursuing a STEM major and to identify candidates from under-represented groups; 3) Recruit STEM professionals who are considering a career change or have been or may be laid off afterwards to reflect on the experience. We will foster relationships with area company’s human resources departments to attract professionals who have the interest and ability to become teachers.

Progress on these activities: 1) The grant funded ten (10) WWU freshmen/sophomores to work in local high needs districts teaching summer school mathematics and science during summer 2010. At the time of this abstract, we anticipate 15 to 20 summer interns for summer, 2011. Interns meet with the grant PI (Bruce Larson) and co-PI (George Nelson) to prepare for the summer internship, keep journals on the experiences, and meet with the PI/co-PI afterwards to reflect on the experience. Participants in the summer internships during 2010 showed significant improvements in their understanding of teaching mathematics and science and in their interest in becoming middle school/high school mathematics teachers. Two interns were eligible to apply and have been accepted into the Secondary Education Teacher Preparation program and are now Noyce Scholars; 2) As of Spring, 2011 we will have awarded nineteen (19) awards to WWU students who are pursuing a teaching certificate to be middle school/high school mathematics and/or science teacher (grade 6-12). The awards total $190,000 of financial assistance; and 3) Recruitment of STEM professionals who are considering a career change will be an area of focus in 2011-2012.
The project builds upon established partnerships with high-need school districts, a new urban teaching track and fifth year induction program, several established STEM programs in place at the university, and Wittenberg’s strong undergraduate research and presentation ethic. The distinct strength of liberal arts and sciences institutions is interdisciplinary collaboration and discovery and small classes, which enable personal attention and mentoring by dedicated professors. These are viewed as essential elements in the preparation of STEM teachers. The blend of strong content preparation and research experiences will prepare students to create environments of discovery and inquiry-based learning in their classrooms.

The Noyce grant will support a goal of our work to grow and nurture a community of STEM students, in-service STEM master teachers, STEM faculty, and STEM education faculty. This community will work together to create a vision of urban teaching for our pre-service teachers, inspire them to teach, mentor and support them along their path into teaching, and hope that they will inspire young minds, instill hope for the future, and a desire to become a STEM teacher.

The Impacts of Intensive Fieldwork on the Development of Pre-service Teachers

A central component of the Noyce Mathematics and Science Teacher (MaST) Scholars Program at York College is the intensive fieldwork that scholars do in preparation for their student teaching. Between freshman and sophomore years, science and mathematics majors from York College and the partnering Community Colleges of the Borough of Manhattan, Bronx, LaGuardia, and Queensborough, are introduced to field-based learning experiences through the Teachers Explorers program. Through internships in the Science, Engineering, Mathematics and Aerospace Academy (SEMAA) program, a NASA-based summer camp, Teacher Explorers analyze what they are learning as classroom assistants and discover whether they want to pursue teacher preparation. Once the undergraduates are accepted to the MaST Scholars program, their fieldwork intensifies. In addition to the fieldwork that they conduct as part of their Foundations and Methods Teacher Education courses (totaling 105 hours prior to student teaching), MaST Scholars complete 20 hours of fieldwork each semester.

All of this fieldwork is conducted in high-needs schools in which the Scholars might be employed upon graduation. Analysis of the Teacher Explorers’ and Scholars’ reflections about their fieldwork, demonstrates that they are developing important insights about secondary students, and the ways that they learn. Participants have made important discoveries about effective and ineffective ways of teaching their subject areas through these experiences. The reflections also show that the Scholars are increasing their own skills in scaffolding student learning, both through successes and failures, within a highly supportive learning environment. Scholars claim that the extra field experiences are vital for their success in student teaching. Some of the Scholars have conducted their fieldwork within the MSPinNYC Peer Enabled Restructured Classrooms (PERC). These Scholars have benefitted from learning about this highly successful educational model and from participating in NSF grant-funded research within the project. The reflections of the Teacher Explorers and Scholars also focus on the positive impacts that these undergraduates are having on the secondary school students with whom they interact in these experiences. As they develop their skills of documenting student learning, the Scholars are able to see that they have increased both the content knowledge and the effect on students within these science and mathematics classes.
S/F1
Title: Impact of Teacher-Student Relationships on Motivation and Achievement in High School Biology
Presenter(s): Cristina Galey, Current Noyce Scholar
Email: cristina.galey@bc.edu
Institution: Boston College / Lynch School of Education
School Name & District Currently Teaching: Student Teacher, Brighton High School, Boston Public Schools
Project Discipline: Biology and Secondary Education
URL(s): bcseus.com

Culturally responsive teaching in urban high schools demands cultural competence. This entails establishing high expectations for student achievement; addressing cultural, academic, and economic differences via different modalities and engaging strategies; and developing relationships with students that not only engage them in science learning, but also affirm their abilities and identities. This inquiry investigates the impact of quality caring relationships on motivation and learning in biology of low-performing students. Results varied according to the academic and social-emotional needs of the student, with the most critical variable being the emotional needs of the student. Although teachers are identified as the most influential factor in a student's learning life, factors such as poverty, peer pressure, class, family, and physical/emotional health often trump the teacher's efforts to make a substantive difference in a student's academic life.

S/F2
Title: One is the Loneliest Number: Isolation Effects on Female Crickets Acheta domesticus
Presenter(s): Bethanee Narcisse, Current Noyce Scholar
Email: Betisse2@csu.fullerton.edu
Institution: California State University, Fullerton
Project Discipline: Biology

Past studies have shown that some insects, when reared in groups, develop faster than those reared in isolation (Holbook and Schal, 1998; Ishii and Kuwahara, 1968). Rapid development is adaptive for individuals in a population of sexually reproducing organisms (Stearns, 1976); individuals that reach reproductive age more quickly tend to have higher fitness than those that develop more slowly. Watler (1982) showed that house cricket (Acheta domesticus) nymphs, when reared together, develop into adults faster than nymphs that are isolated. House crickets have life cycles of approximately 80-90 days, and females produce many offspring. Therefore, rapid development could be an important feature of their life-history. Although house crickets are not social insects, they are generally reared in groups as opposed to being in isolation. It is unclear if changes in development time are a result of social environmental conditions (e.g. group or solitary) or a change in social environment. We first plan to verify if the solitary social environment has detrimental effects on development in our house cricket lab population.

S/F3
Title: Benefits of Mentorship
Presenter(s): Allison Milam, Current Noyce Scholar and Ashley Holeman, Current Noyce Scholar
Email: tucksonmom@juno.com and teknthzpn@hotmail.com
Institution: California State University, San Bernardino
Project Discipline: Mathematics

New Noyce Scholars at Cal State San Bernardino are not always aware that the opportunity for mentorship by an exemplary educator currently in the field is anything out of the ordinary, and they might even take it for granted. Mentorship is a huge part of what makes students want to join our Noyce program and an integral part of its success. Our poster makes use of the letters in the word Mentorship to convey the benefits that we have experienced as scholars in the Cal State San Bernardino Noyce program.

M - Meeting individual needs: Every participant in the program benefits from having a quality Noyce mentor teacher at their disposal. These special teacher/scholar relationships provide opportunity for growth in the scholar that can be specifically designed for his/her own unique needs.

E - Evaluation: Each Noyce scholar benefits from quarterly evaluations of their classroom performance by their mentor teacher.

N - New Friendships: Through the mentorship program and monthly seminars, Noyce Scholars have lots of opportunities for meeting new friends and building professionally based relationships. Who knows when one of these new acquaintances might give you a tip that will help make you a better teacher?

T - Teaching opportunities: One of the Mentor teacher’s tasks is to give us opportunities to get in front of the class teaching lessons as soon as we can.

O - Opens the door for obtaining employment in the district where we are being mentored.

R - Reflection: Beginning to get our feet wet as a future educator also means learning early about how to reflect on what we are accomplishing in the classroom. This reflection
leads us to adjust our teaching strategies before we are official teachers.

S - Satisfies some of our Teacher Education credit requirements as a bonus for being in the program.

H - Helps teach us the importance of classroom management in a hands-on way.

I - Ignites a passion for teaching. By spending time in the classroom, Noyce Scholars know right away whether teaching is going to be something they will love.

P - Provides enrichment and support in teaching our subject matter. There is no better way to learn the ins and outs of teaching mathematics than in a classroom with a teacher who has been doing it marvelously for many years.

These are just some of the ways that the emphasis on Mentorship in our Noyce program has made a positive impact in our teacher preparedness. It's hard to believe that we have only been in the program for a year and have already learned so much.

S/F4
Title: Robert Noyce Scholarship Program - 'Teachers from the Valley for the Valley'
Presenter(s): Camila Reyes, Current Noyce Scholar
Email: camilaeugenia@pacbell.net
Institution: California State University, Stanislaus
Project Discipline: Mathematics & Science
URL(s): http://www.csustan.edu/NoyceScholarship/

The CSU Stanislaus Robert Noyce Scholarship Program encourages diversity in education and throughout the region. With Stanislaus being listed as one of the top serving Hispanic-serving Universities in the Nation, we are proud of our multicultural heritage and committed to increasing the number of math and science teachers from all backgrounds, including career-changers and re-entry students. Our diverse group of Scholars and Noyce Coordinators reflect our strong commitment to diversity in education.

The California State University system-wide Math and Science Teacher Initiative (MSTI) has as its goal to double the production of math and science teachers in response to a critical shortage. The CSU Stanislaus MSTI is the largest campus-based partnering program for Noyce, providing Scholars with opportunities for professional development, early-field experiences in teaching, and funding to support travel to educational conferences and events.

California is projected to need upwards of 50,000 new math and science teachers within the next 10 years. Currently, the demand for credentialed teachers in these fields is significantly higher that the supply of fully qualified teachers. Large numbers of students in California are being taught math and science by teachers who are not credentialed in these areas. Having access to qualified math and science teachers is associated with improved achievement. If we are to remain a leader in science, technology and mathematics and maintain our economic vitality, California must make high quality math and science education a top priority.

S/F5
Title: Problem-Based Learning, Connecting Baking to Titrations
Presenter(s): Blaire Volbers, Current Noyce Scholar
Email: bmv12@case.edu
Institution: Case Western Reserve University
Project Discipline: Chemistry

Students are more engaged in their own education when they can see purpose behind what they are learning or can relate it to their own lives. This problem-based learning unit was formed around a problematic baking recipe, and it is the student’s job to find the answer. The students were presented with the problem initially, and they had to use what they learned about acids and bases to formulate a logical solution and test it. It is also possible to modify and adapt the unit to adhere to different levels of supplies and curriculum. It focuses on the features, benefits, and applications of problem-based learning.

S/F6
Title: Virtual Manipulatives and Student Achievement
Presenter(s): Antrell Banes, Current Noyce Scholar
Email: antrellbanes@yahoo.com
Institution: Clark Atlanta University
School Name & District Currently Teaching: Westlake High School, Fulton County Schools
Project Discipline: Mathematics
URL(s): www.robertnoycemspt.cau.edu

With the advancement of technology, educators have been discovering new ways to teach students. One way is with virtual manipulatives. The purpose of this research is to investigate the use of virtual manipulatives in mathematics instruction. The researcher wants to find out if the use of virtual manipulatives will increase students’ test scores and conceptual understanding in the teaching of right triangles.
The problem is that students are not passing tests given on right triangles. The sample consisted of 22 tenth grade math students at an urban public school. The students were divided into two groups/classes not chosen by the researcher. One group was the treatment group in which the researcher used a combination of lecture and virtual manipulatives, while the other group, the control, only used the traditional lecture method. Each sample was given a pre-test in which the scores were compared using t-tests. After matching the individuals that are similar, the treatment was administered. A post-test was given at the end of a two-week period. The post-tests were compared to the pre-tests, and then the post-tests of each group were compared using t-tests. Data collected was graphed and analyzed. The data showed that there was no significant difference in using a virtual manipulative versus using a traditional lecture method.

S/F7
Title: Are Manipulatives Being Over Used or Not Used Enough?
Presenter(s): Courtney Greene, Former Noyce Scholar
Email: courtneyvgreene@gmail.com
Institution: Clark Atlanta University
School Name & District Currently Teaching: Rome City Schools
Project Discipline: Mathematics

I want to investigate the issue of whether children really need manipulatives or are they hindering them. The best way for a child to learn is to be actively involved in what the teacher is teaching. Children need to create and express their knowledge in order to find meaning in their learning experiences. By letting a child be engaged in the learning activity, they are taking control of their education and understanding. The use of a manipulative does help a child be actively involved in what they are learning.

We must do research and study our youth in today’s schools to determine how to help them understand basic math skills. With the results of our study and research, we can then assist the students in finding out what works and what doesn’t. I feel some students aren’t being introduced to manipulatives so they can’t fully understand math concepts. Other students are using too many manipulatives so it becomes a crutch in their learning. Students need to be able to recall facts without relying on those simple tools they had used in order to learn simple mathematical concepts.

What can we do to help students retain basic mathematical skills? I aim to investigate the effect of the use of manipulatives in my class on students’ conceptual understanding and achievement.

S/F8
Title: A Noyce Scholar’s Opinion on the Most Useful Information from “How Students Learn”, a One-Credit Add-On Course at the College of William and Mary, Applications of Class Material in Teaching Geosciences, Discussion of Benefits, and Suggestions for Course Improvement
Presenter(s): Caitlin Broznak, Current Noyce Scholar
Email: cmbroznak@email.wm.edu
Institution: College of William and Mary
Project Discipline: Geoscience

‘How Students Learn’ is a one-credit required course on memory and learning for Noyce Scholars in mathematics and sciences at the College of William and Mary. This course helps prepare future high school STEM educators by giving them an overview of how students learn and of techniques that may improve learning. As a Geology major, the most useful concepts I took from the class were (1) cognitive capacity, (2) how memories are formed, (3) how background knowledge can be useful in assimilating new knowledge into long-term memory, and (4) the importance of creating “chunks” of information to facilitate memory formation. In this poster, I show how I took these particular concepts and incorporated them when designing a lesson teaching the Virginia Earth Science Standard of Learning (ES. 6).

This poster also discusses benefits and suggestions for improvement of a Noyce add-on class of this kind for Noyce Scholars at other institutions. The major benefits were having knowledge about students’ capabilities to learn, and how to make the learning process efficient for students. One suggestion is to reduce detail on the biology of memory in order to cover more practical applications in the classroom. A second suggestion is to broaden the content to expose Noyce scholars to additional learning techniques, including Retrieval Practice and Concept Sketching. Because the instructor is developing free on-line materials for the class, this information may be of interest to other Noyce Scholars or Noyce programs.

S/F9
Title: Multiple Uses of Google Earth in the Secondary Science Classroom
Presenter(s): Katie Brehm, Current Noyce Scholar
Email: katieabrehm@gmail.com
Institution: Duke University
In fall 2010, an independent study was initiated on the use of Google Earth in a secondary science classroom in North Carolina. Initial findings reveal the advantages for students and educators of using the Google Earth platform alongside a variety of existing geospatial web-based resources. This poster presentation demonstrates ways in which the flexible and expandable platform of Google Earth will allow students to achieve learning objectives in the earth and environmental sciences and other disciplines. Several existing resources are examined and evaluated with regard to their practical usefulness. Sample assessments will be provided. The presentation will center on how to transform our notion of Google Earth from a visualization tool to a well-rounded portal facilitating understanding.

S/F10
Title: Summer of Innovation
Presenter(s): Tiffany Hunter, Current Noyce Scholar
Email: tshunter03@gmail.com
Institution: Hampton University
Project Discipline: Biology
URL(s): www.nasa.gov/SoI

Summer of Innovation (SoI) is a leading program that was proposed by President Barack Obama. The pilot began in the summer of 2010, with the purpose of providing rigorous complementary science, technology, engineering, and mathematics (STEM) educational support to underrepresented, underserved, and under-performing middle school students. The program called for national support, and the National Aeronautics and Space Administration (NASA) was prompt in responding. The SoI initiative’s goal was to increase test scores in STEM, and yield a positive change in academic performance. NASA used its creativity and mission to work with other partners to engage middle school students in this wonderful experience and strengthen the future workforce.

This SoI initiative provides students with an opportunity to be continuously engaged, as well as improve their learning. NASA’s Office of Education specialists and interns conducted training sessions, called Train-the-Trainer, for educators and community leaders. The workshop provided STEM activities that these educators can deliver throughout their community. In addition, NASA tapped into many summer camps, youth organizations, charter schools and churches to find these individuals. Various activities and presentations were performed to promote Summer of Innovation.

S/F11
Title: Learning Mathematical Reasoning by Using Robot Vehicles
Presenter(s): Kevin Fletcher, Current Noyce Scholar and Moayad Toom, Current Scholar
Email: yungskav@gmail.com and mtoom@hunter.cuny.edu
Institution: Hunter College CUNY
Project Discipline: Mathematics

We describe an ongoing project to use educational robotics to improve students' understanding of mathematical reasoning and to promote engagement in STEM fields. Project materials are LEGO Mindstorms robot vehicles with interfaced probes and an iconic programming to foster more interest in various STEM topics such as computer programming, scientific methods, open-ended problem solving, and more.
The purpose of the summer program is to encourage students to become self-advocates. Three days of the week are spent taking classes or working on credit recovery, the fourth day of the week is focused on an enrichment field-trip (such as a trip to the state capital or learning how to navigate public transportation), and the fifth day is an optional ‘catch-up’ day for the students.

This program has shown tremendous success in the five years since it was started and is a unique program supported by a strong and dedicated teaching staff.

S/F14
Title: Using Nanofabrication to Teach About Semiconductors
Presenter(s): Elena Cox, Current Noyce Scholar
Email: elenacox@bellsouth.net
Institution: Kennesaw State University
School Name & District Currently Teaching: Berkmar HS, Gwinnett County, Georgia
Project Discipline: Physics

As part of a unit, presented in a secondary conceptual physics class, the conductor, semiconductor, and insulator materials used in integrated circuits were discussed. In particular, their application to the manufacturing of integrated circuits and sensors were presented. Furthermore, a miniaturized sensing system, based upon a gas chromatographic column, was manufactured on a silicon wafer in the Nanotechnology Clean Room at Georgia Institute of Technology. This microelectromechanical sensor was used in student experiments to demonstrate the principle of the separation and in particular to determine the composition of water solution of two food dyes.

S/F15
Title: Learner Generated Graphic Organizers
Presenter(s): Robin Grajeda, Current Noyce Scholar
Email: rgrajeda@kennesaw.edu
Institution: Kennesaw State University
Project Discipline: Mathematics

Graphic organizers can be used to assist students in developing a deep conceptual understanding of mathematical concepts and provide nonlinguistic representations that teachers can use to examine mathematical ideas. A graphic organizer consists of a spatial arrangement of words or word groups that represent the conceptual organization of a text (Stull & Mayer, 2007).
Some examples of graphic organizers are: lists, flowcharts, hierarchies, and matrices. Graphic organizers are useful in helping learners process concepts more deeply. They can be used to help them develop academic language and retain important information (Marzano, Norford, Paynter, Pickering, & Gaddy, 2001). In general, they are visual structures that help students organize mathematical concepts, ideas, or other information (Mendieta, 2005). Research provides evidence of the benefits of using graphic organizers to help students process mathematical concepts more deeply. Research also indicates that students’ conceptual understanding of mathematics concepts is increased when they are actively engaged in their own learning. An important question is, do students learn more deeply when they are actively engaged in creating their own graphic organizers or do they learn more deeply when the teacher provides them with a pre-made graphic organizer? This poster will examine the use of student made or learner-generated graphic organizers and the role they play in helping them understand inverse functions. Learner-generated graphic organizers will be presented along with students’ perceptions of how creating their own graphic organizers contributed to their learning and understanding of inverse functions.


S/F16

Title: Middle Tennessee State Physics - Mathematics Noyce Program
Presenter(s): Dylan Russell, Current Noyce Scholar
Email: wdr2j@mtmail.mtsu.edu
Institution: Middle Tennessee State University
Project Discipline: Physics & Math

Among the STEM disciplines that have a deficit of qualified high school teachers, the need is greatest in Physics and Mathematics. The MTSU Physics-Mathematics Noyce Scholarship program was developed to address both of these areas in a state where the need for all STEM teachers is acute. Our program will develop a cadre of teachers who are knowledgeable and passionate about their content material at a depth that will enable them to not just instruct, but also inspire high school students toward STEM careers. At MTSU, we have developed a culture that places a high priority on STEM education. In fact, our president has articulated the goal of graduating the largest number of secondary STEM teachers in our state. The Physics and Astronomy, and Mathematics departments have worked closely to develop a curriculum that will allow students to graduate with endorsements to teach both subjects, and that works within the structure of our university’s new UTeach replication program.

S/F17

Title: Developing Teachers for a New Century of Learners
Presenter(s): Simeon Weatherby, Current Noyce Scholar and Jennifer McCoy, Current Noyce Scholar
Email: stw9@msstate.edu and jmm704@msstate.edu
Institution: Mississippi State University
Project Discipline: Mathematics

Research on effective teaching suggests teachers need to have a solid foundation in the subject matter supported by strong theoretical and pedagogical knowledge (Goldhaber & Brewer, 1996; National Research Council, 2001; Darling-Hammond & Wise, 1992; Legler, 2002). The Noyce STEM Teachers Scholars Program at Mississippi State University confronts this challenge by offering talented STEM majors the opportunity to become effective teachers by receiving a dual degree -- a degree in a STEM field plus a mathematics or science education degree. First-year Noyce Scholars will describe, through personal narratives, how the Noyce program is equipping them with essential knowledge and skills to become effective high school mathematics teachers. Their narratives offer suggestions about how passion, confidence, and expertise might contribute to teacher effectiveness and retention.

S/F18

Title: NYU Noyce Fellowship Program
Presenter(s): Samantha Tulloch, Current Noyce Scholar
Email: skt253@nyu.edu
Institution: New York University
Project Discipline: Math
URL(s): steinhardt.nyu.edu/noyce

The New York University (NYU) Noyce Scholarship Program advertises among NYU and NYU-Poly STEM-major
undergraduates to recruit them into secondary school math and science teaching. The Program prepares them for careers as teachers in high-needs schools by providing: (1) early familiarity with effective secondary school teaching; (2) a sense of secondary school teaching as a good career path for scientists and mathematicians; and (3) accelerated preparation for full professional certification as secondary school teachers. The Program assists with job placement in high-needs secondary schools and supports early career teachers.

Thus far, the Program has admitted nine students to the masters’ program as Noyce Scholars, five or whom have graduated and are now completing their first year of teaching in high-needs schools, four with a two-year teaching commitment, one with a one-year commitment, and four of whom are presently completing their master’s programs and preparing to begin teaching in September 2011. The program has also enrolled four new Noyce Fellows to begin their master’s program in June 2011, and has directed a number of senior students to other teacher preparation programs in math and science secondary education.

Four of the first NYU Noyce Scholars, helped conduct a conference at NYU. The conference was attended by more than 200 public school science teachers, school district personnel, university students, and faculty to discuss math and science teaching in urban schools. The Noyce Scholars explored the perspectives of urban students on math and science education, by holding a panel discussion with students from New York City public schools. The Noyce Scholars discussed with these students their own experiences teaching diverse student populations. The discussions were videotaped and were presented, with analysis, by the Scholars at the 2010 annual Noyce Conference.

**S/F19**

**Title:** Engaging Students through Project-Based Learning  
**Presenter(s):** Lauren Metcalf, Current Noyce Scholar  
**Email:** lauren.metcalf@gmail.com  
**Institution:** Ohio University, SEOCEMS  
**School Name & District Currently Teaching:** Federal Hocking Middle School  
**Project Discipline:** Middle School Math and Science  

Using the Project-Based Learning (PBL) model, students engage in an inquiry project in response to a complex challenge from a community partner. The projects allow student choice in learning activities covering key academic content. Compared to traditional curricular methods, students practice more 21st century skills including collaboration, communication and critical thinking (Buck Institute for Education, 2011) through PBL. Technology is also used to practice these skills. At Federal Hocking Middle School, 8th grade mathematics students responded to a challenge from the summer education program to plant a food-production garden and leave instructions for summer students on what to expect when caring for and harvesting the crops (e.g., the chance the crops will survive and yield a full harvest). Through the project, 8th grade students explored and applied mathematical concepts such as area, perimeter, percent and probability. They chose a technology-based medium for creating instructional messages for the summer students. Through surveys, interviews and observations of student work, the researcher examined student perceptions of their level of interest and performance on the activities as well as their effectiveness at communicating what they had learned.

**S/F20**

**Title:** Science Qualifications of Administrators  
**Presenter(s):** Luisa McHugh, Current Noyce Scholar  
**Email:** luisamchugh@mac.com  
**Institution:** Stony Brook University  
**School Name & District Currently Teaching:** William Floyd School District  
**Project Discipline:** Biology  

I teach in a high-needs school district in Suffolk County, on Long Island in New York. Long Island is located in Southern New York bordering New York City. The western part of the island actually contains the New York City boroughs of Brooklyn and Queens. To the east of this there are two counties, Nassau and Suffolk, which are regarded as suburbs of the city. New York City is the largest city and the largest single school district in the USA, with over one million students. Nassau and Suffolk counties by comparison are made up of 125 distinct small school districts. As a mini-research project in the Noyce Program, I have been investigating the science qualifications of school administrators (superintendents and principals) in Suffolk County. This poster highlights some of the findings, regarding their educational backgrounds and scientific training.

**S/F21**

**Title:** Benefits for Non-traditional Noyce Scholars  
**Presenter(s):** Sara Ashley, Current Noyce Scholar  
**Email:** s.ashley_0915@yahoo.com  
**Institution:** Texas Tech University  
**Project Discipline:** Non-traditional Students in the Texas Tech Noyce Scholars Program
This poster’s focus will be on several non-traditional students in the Texas Tech Noyce Scholars Program. The Noyce Program makes it possible for those in that demographic to follow through with their college and future career goals. One student describes how her passion for mathematics and teaching runs deep and without this scholarship program she would not have been able to complete her degree. This program benefits the Noyce Scholars in many ways other than fiscally. The poster presents the ways that this program helps all aspiring math and science majors who wish to become teachers.

S/F22
Title: Recruiting and Supporting Noyce Teaching Fellows through a Master of Arts in Teaching Program
Presenter(s): Stephanie Sanders, Teaching Fellow
Email: ssanders@trinity.edu
Institution: Trinity University
Project Discipline: Science and Mathematics Education
URL(s): http://web.trinity.edu/x2029.xml

STEM professionals who choose to enter teaching face a series of challenges that younger students following a more traditional path do not face. These challenges include logistical (e.g., caring for a family while spending all day in school and completing evening classes), social (e.g., revisiting their identity as a student among younger classmates), and financial (e.g., forgoing a year of salary during the M.A.T. program) issues. Such challenges impact potential career changers’ decision about whether to complete an M.A.T. degree (rather than pursue an alternative certification pathway) and success within the program. In this poster, we present strategies for recruitment through both formal and informal communication channels and discuss strategies for providing career changers with additional support when preparing for and completing the M.A.T. program at Trinity University. Strategies include individualized readiness plans, interactions with previous M.A.T. students, and designing coursework that makes connections between theory and practice explicit. Our Teaching Fellows have reported feeling prepared to begin the program and well supported throughout their experience.

S/F23
Title: Encouraging Community Involvement with Science Night
Presenter(s): Brandon Wolfe, Current Noyce Scholar
Email: bwolfe@yumaed.org
Institution: University of Arkansas
School Name & District Currently Teaching: San Luis High School, Yuma Union High School District
Project Discipline: Science

San Luis High School’s science night brings more than one thousand parents and middle-school children into our campus for an evening of hands-on science. In addition to promoting our school to the community and informing younger students about what science looks like at the high school level, science night also serves as a fund raiser for our annual science field trip. In this poster, we explore some of our experiences in creating and growing science night, suggest activities, and present an informal list of do’s and don’ts for those thinking about their own science night.

S/F24
Title: Think Spit: My Oral Activity Compared to Yours
Presenter(s): Judith Borcelis, Current Noyce Scholar
Email: jvborecels0703@berkeley.edu
Institution: University of California, Berkeley
Project Discipline: Biology

A series of experiments were performed that investigated appropriate methods for using Iodine to test amylase activity at different hydration levels. Data will be presented that uncover potential relationships between thirst perception, hydration levels, and the pH and activity of salivary amylase.

S/F25
Title: Student Difficulties with Order of Operations in Calculus
Presenter(s): Ian Caldwell, Current Noyce Scholar
Email: ian.caldwell@colorado.edu
Institution: University of Colorado, Boulder
Project Discipline: Mathematics

Collaborative research being conducted by a mathematics faculty member and a Noyce Fellow investigates the types of difficulties that students have solving problems in calculus. We specifically focus on issues students have with order of operations. We have investigated the literature and generated a preliminary list of common difficulties with order of operations and on the basis of this built and tested a survey to understand students’ reasoning. Preliminary results will be discussed plans for future data collection, analysis, and instructional interventions.
**S/F26**  
**Title:** Foundations of an Online Lab Resource at the University of La Verne  
**Presenter(s):** Madeline Clements, Current Noyce Scholar  
**Email:** madeline.clements@laverne.edu  
**Institution:** University of La Verne  
**Project Discipline:** Biology Teaching Track  

Research has illustrated that incorporating technology into education is important in order to reach the current “net generation” students. Our goal is to incorporate technology into the Animal Biology Laboratory at the University of La Verne by creating an online resource for students. This online resource will provide students with outside information including images and videos of live organisms they are covering in lab each week, as well as provide a place to store their own information in the form of a digital lab notebook. By giving students the extra information beyond what is covered in lab, they get the chance to see what an organism looks like when it is alive and/or in its natural habitat, rather than only observing animals in a preserved state. In order to make the online resource available in the classroom, the Biology Department is applying for a Title V STEM grant to obtain a class set of iPads. Students will have access to the digital lab manuals and other lab materials in lab and outside of class through a content management system. By incorporating technology into the laboratory setting, students will be able to study at their own pace, which will increase focus and understanding of the learning outcomes for the course.

**S/F27**  
**Title:** Increasing Interest in Science Using Interactive Lessons  
**Presenter(s):** Caitlin Kams, Current Noyce Scholar  
**Email:** caitlin.kams@laverne.edu  
**Institution:** University of La Verne  
**Project Discipline:** Biology Teaching Track  

At the secondary level, interest in STEM-related subjects has decreased in recent years. Research indicates that because “net generation” students have grown up with technology, they need to be engaged in different ways than previous generations. Teachers of net generation students need to incorporate lecture with interaction, inquiry-based activities, cooperative learning, and technology into each lesson. For this project, we attempted to create engaging, interactive lessons for local high school students. Our goal was to increase interest in STEM disciplines and to make new technologies and techniques available to teachers and students. We conducted surveys to gauge students’ interest and familiarity with science before and after each interactive lesson. Our one-day laboratory lessons showed an increase in interest in science, but did not show a difference in students’ perception of the fun of science. Future studies should reach out to more high needs schools and add mobile technology and interdisciplinary activities to lessons.

**S/F28**  
**Title:** Energy in the Ecosystem: Where is it from? How does it flow? Where does it go?  
**Presenter(s):** Cacie King, Current Noyce Scholar  
**Email:** cekwvf@mail.missouri.edu  
**Institution:** University of Missouri-Columbia  
**Project Discipline:** High School Biology - Ecology Unit  

This is a 5E lesson designed with student misconceptions regarding how energy flows in an ecosystem in mind. It begins with activities that attempt to reveal the prior knowledge of students followed by exploration tasks that challenge students’ thoughts and encourage them to reflect upon their ideas. Then, students are presented with an explanation followed by the opportunity to apply what they are learning to new scenarios. This lesson focuses on providing students with a solid knowledge base to build upon so that they can apply what they are learning inside the classroom to things happening in the real world, such as habitat destruction and deforestation.

**S/F29**  
**Title:** Designing Lessons for All Three Types of Learners  
**Presenter(s):** Amanda Weidler, Current Noyce Scholar  
**Email:** weidler_house@att.net  
**Institution:** University of North Texas  
**Project Discipline:** Biology  

The Teach North Texas Program at UNT, has provided me with many opportunities to develop as a Biology teacher. My experience in one course, Classroom Interactions, gave me the opportunity to put into action a lesson designed to reach each of the three types of learners, auditory, visual and kinesthetic. This lesson on Mitosis was designed to allow students to develop their intellectual ability by having different stages of the two-day lesson tailored to accommodate the three styles of learning with a variety of activities to strengthen their intellectual skills. For the visual learners, I had a power point with detailed pictures, diagrams and a video. The students had a worksheet to take notes and
Title: The Saturday Morning Breakfast Club: Promoting Success of the At-Risk
Presenter(s): Jacqueline Medford, Current Noyce Scholar
Email: jacqueline_medford@yahoo.com
Institution: University of Northern Colorado
School Name & District Currently Teaching: Greeley West High School -Weld County District 6 - Greeley, CO
Project Discipline: Earth Science and Physics

As a Scholar in the Noyce Scholarship Program of the University of Northern Colorado, I had a unique opportunity to initiate a new program at Greeley West High School, Greeley, CO. This program was started while I was also completing my student teaching semester at Greeley West. The Saturday Morning Breakfast Club concept created a setting of an alternative learning environment for at-risk youth who were failing all or most of their classes, at risk of dropping out, on probation and/or at risk of going to jail. Students had access to resources and tools needed to complete assignments for class work, but in a contained and more restrictive environment every other Saturday. The Saturday Breakfast Club has allowed for redirection and guidance on more positive behaviors and promoted the student’s academic education. Such a setting provided an opportunity for the student to work their way off probation. Documentation of behaviors and academic progress were given to administration and their probation officers for court, which allowed the student to demonstrate their willingness to improve and make more positive choices. The goal was to interrupt, change and redirect the delinquent behaviors in the classroom setting and maintain academic progress. Additionally, it was to provide life skills training and academic education so the students could become productive not only in the mainstream classroom, but within the community and avoid becoming repeat offenders in and out of the classroom.

Title: Communicating Mathematics
Presenter(s): Ashley Anderson, Current Noyce Scholar
Email: ashley.dorris.anderson@gmail.com
Institution: University of Pennsylvania Graduate School of Education
School Name & District Currently Teaching: Furness High School; School District of Philadelphia
Project Discipline: Mathematics

Currently, the Mathematics Enrichment class at Furness High School consists of 9th grade students who scored at a level of
Below Basic on their 8th grade PSSA exams. Since the Mathematics Enrichment class is taken in addition to the students’ Algebra I course, my classroom mentor and I believe that it is important that this space is used for students to be able to explore math in a different way. The class currently uses the SpringBoard Mathematics with Meaning curriculum. The curriculum helps students to see that mathematics impacts them daily. I anticipate that through the exploration of my inquiry question (How do the students in my Math Enrichment class respond when asked to explore mathematics through written and verbal communication, and creatively investigate everyday applications of math?), my students will be able to: 1) organize and reflect on their learning in mathematics (thinking about where they started in the unit, what they have accomplished, what helped them to learn, and how they can apply the new knowledge in the future) through written and verbal communication; 2) demonstrate an improved procedural knowledge and communication skills around mathematics; 3) explain mathematics verbally and how it can be applied in life; 4) recognize individual growth in their work in math; 5) self-evaluate their progress in the Mathematics Enrichment class; and 6) construct a summary of their work for the unit. I also hope that through my inquiry I will be able to recognize and diagnose the nature of students’ conceptual problems and develop a model for other mathematics teachers struggling to implement literacy in the classroom.

**S/F33**  
**Title:** Culturally Responsive Biology Instruction  
**Presenter(s):** Gianna Brisbone, Teaching Fellow  
**Email:** gmbrisbone@hotmail.com  
**Institution:** University of Pennsylvania Graduate School of Education  
**School Name & District Currently Teaching:** School District of Philadelphia  
**Project Discipline:** Biology  

I believe that teaching is bidirectional. My students teach me how to be a better teacher by offering suggestions for the class. I help them to become better students by scaffolding and modeling materials for them, and encouraging them to be knowledge-seekers through independent activity. However, for any of this to occur, good classroom management practices and culturally relevant curricula are essential. My poster will reflect culturally relevant teaching in biology and illuminate the interplay between classroom management and instruction.

**S/F34**  
**Title:** PR Master Math Teacher Program  
**Presenter(s):** Josiel Rosado, Master Teaching Fellow  
**Email:** joux_jr@yahoo.com  
**Institution:** University of Puerto Rico-Rio Piedras  
**School Name & District Currently Teaching:** Juan Quirindongo High School, Vega Baja, P.R.  
**Project Discipline:** Math & Science  
**URL(s):** http://alacima.uprrp.edu/MMT

The University of Puerto Rico in Rio Piedras (Faculty of Natural Sciences) is developing a Robert Noyce Master Teacher Fellowship initiative in collaboration with the Puerto Rico Department of Education (PRDE) to establish the first Puerto Rico Master Math Teacher Program (PRMMTP). This project will certify ten 7-12 grade mathematics teachers, who teach in high-need school districts, as Master Math Teachers (MMT) through the University of Puerto Rico Rio Piedras Campus’ Division of Continuing Education. Josiel Rosado is a 2009 Master Teacher Fellow of the Puerto Rico Master Math Teachers. He has a Master degree in Mathematics Education and currently teaches Elemental Algebra I & II, Geometry I and Pre-calculus at the Juan Quirindongo High School in Vega Baja, PR. His poster is a description of his professional experiences with the project, his experience modifying and transferring activities to the classroom, and his expectations. As a MMT, he will serve as role model for exemplary mathematics teaching practices, an expert in content knowledge, integrating technology and use of manipulatives, and a leader among his peers to promote improvements in the student’s academic achievement. He is receiving an intensive professional development program, that includes inductive and deductive reasoning, mathematical models: linear, quadratic and exponential and the Integration of Math Education and Research.

**S/F35**  
**Title:** The Effectiveness of Modeling on High School Students’ Conceptual Understanding of the Atomic Structure  
**Presenter(s):** Adam Wilson, Current Noyce Scholar  
**Email:** awilso81@utk.edu  
**Institution:** University of Tennessee  
**School Name & District Currently Teaching:** Central High School, Knox County Schools, TN  
**Project Discipline:** Chemistry  

This study explored the impact of modeling on high school students’ conceptual understanding of the atomic structure within a college preparatory chemistry course. The
participants involved are 10th, 11th and 12th grade students in an urban school. Pre- and post-test assessments were used to measure student’s conceptual understanding before and after the intervention. Preliminary data suggests that the use of modeling resulted in moderate learning gains in student’s conceptual understanding of atomic structure.

S/F36
Title: UTech with Noyce Funding
Presenter(s): Miwa Murray, Current Noyce Scholar
Email: amm072100@utdallas.edu
Institution: University of Texas at Dallas
Project Discipline: Other: Cognitive Science

The UTech program has been partially funded by Noyce. The money Noyce has given to UTech has been awarded to students in the program via internships and scholarships. The poster will show the breakdown of how the money has been distributed.

S/F37
Title: Learning about Genetically Modified Organisms (GMOs)
Presenter(s): Erin McCuin, Current Noyce Scholar
Email: emccuin@gmail.com
Institution: University of Vermont
School Name & District Currently Teaching: Mount Abraham Union High/Middle School ANESU
Project Discipline: Biology

The goal of this poster presentation is to highlight a multiple day lesson on genetically modified organisms (GMOs) as part of a genetics unit designed for a 9th/10th grade biology class. The learning objective of this multiple day lesson was for students to understand recombinant DNA synthesis and the many sources of GMOs in our everyday diets. In order to construct this understanding, students conducted research, engaged in an evidence-based debate, and developed a written response that summarized their evolving views of GMOs. Ultimately, the goal was for students to appreciate the importance of using evidence acquired from research to formulate a position on a vital issue that will continue to be significant to scientists and consumers in the future.

S/F38
Title: Inspiring Instrumental Genesis Through Guided Reflection
Presenter(s): Jacob Perry, Current Noyce Scholar
Email: perrjs0@wfu.edu
Institution: Wake Forest University
Project Discipline: Mathematics, Technology, Education

This research project investigated the various aspects of the individual student’s process of instrumental genesis. Focus groups were used to identify specific important factors that contributed to how students develop an understanding of mathematics through using the TI-Nspire calculator. These identified factors were then used to develop a framework for critically analyzing four case studies of individual students using the Nspires in an investigational activity.

Research Question: Does analyzing and addressing student misconceptions improve student achievement?

Participants: All students in two of the researcher’s standard Algebra II classes will participate in the study, a total of 39. Of these students, those who return informed assent forms signed by the student and informed consent forms signed by their legal guardians will be the active participants (the participants who the researcher might interview), and those who do not return the form will only contribute to the quantitative data collection as part of the collective. Students will not be excluded from the study based on gender, race/ethnicity, or age. The researcher will analyze the work of all participating students and a selected number of these participants will take part in informal interviews where they will be asked to solve math problems orally.

Measures: Artifacts - short 1-2 question daily (or every other day) quizzes that test procedural and conceptual understanding of the previous day’s (or couple of days’) material; unit tests that test procedural and conceptual understanding of the completed unit; lesson plans where misconceptions found in quizzes are specifically addressed.

Interview: The presence of particular misconceptions will be confirmed by holding audio-recorded informal interviews with a representative group of participants during which the students will solve problems similar to the quiz questions orally, explaining their thought processes as they work towards the solution.
Observation: Log/note-taking of the methods and thought processes the researcher used when analyzing the quizzes for misconceptions, log/note-taking of the methods and thought processes the researcher used when analyzing the oral interviews for misconceptions.

Analysis: The data collected will be analyzed by comparing scores of the quizzes to the scores of the unit tests in order to determine if there is improvement in student achievement after the material was re-taught based on the misconceptions identified and analyzed in the participant quizzes and interviews. Five case studies of specific misconceptions identified, categorized, and addressed by the researcher will be compiled, including in each case study the outcome for one of the participants in whose quiz the misconception was found.
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